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THE EFFECTIVE USE OF ILLUMINATING GLASS



Corning Glass Works
Corning, New York

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FOR THE YEAR 1900
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THE EFFECTIVE USE OF ILLUMINATING GLASS

Especially Prepared for
Architects, Interior Decorators
Fixture Designers and Lighting Engineers

by

ILLUMINATING AND OPTICAL DIVISION

of

CORNING GLASS WORKS

Corning, New York

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THE EFFECTIVE USE OF ILLUMINATING GLASS

The object of this presentation is to show how glass may be used to create lighting effects and to illustrate various applications of Macbeth illuminating glass which is now available from Corning Glass Works.

Any lighting fixture consists only of three major parts --the diffusing or reflecting medium, the metal assembly and the lamp--with accessories. The properties of glass have made it the most important diffusing or reflecting medium. Glass can be highly transmitting, highly reflecting, or reflecting and transmitting in various degrees with almost perfect diffusion or with the minimum of diffusion. Glass is permanent, as time has proven; good glass will not change in color nor will it warp or crack with ordinary usage. It is clean and sanitary. For these reasons glass has been and will continue to be the most important tool for good lighting.

NOMENCLATURE OF ILLUMINATING GLASSES

Opal Glass - A highly diffusing glass having a nearly white, milky or gray appearance. The diffusing properties are an inherent, internal characteristic of the glass.

Opalescent Glass - A type of opal glass having the properties of selectively transmitting and diffusing light with a resultant fire appearance when used with concentrated incandescent sources of light. Sometimes referred to as fire opal.

Alabaster Glass - A glass, designed to simulate natural alabaster, which has a gray or paraffin-like appearance. For a given thickness it usually has less diffusion than opal glass.

An alabaster appearance can also be obtained by casing a clear and an opal glass; and while this should be classed as a cased glass, it is sometimes called alabaster.

Cased Glass - A glass composed of two or more layers of different glasses--usually a clear, transparent layer to which is added a layer of opal, opalescent or colored glass. This glass is sometimes referred to as flashed, multi-layer, poly-cased, etc.

Enameled Glass - A glass which has had applied to its surface a coating of enamel. These enamels may be white or colored and may have varying degrees of diffusion.

Decorated Glass - A glass to which etching, stains, enamels, etc., are applied primarily for decorative purposes.

Mat Surface Glass - A glass whose surface has been altered by etching, sand-blasting, grinding, etc., to increase the diffusion. Either one or both surfaces may be so treated.

Configurated Glass - A glass having a patterned or irregular surface. The surface configuration is usually applied during fabrication. Such glasses are not transparent and are somewhat diffusing.

Glasses falling under this classification are often referred to as pebbled, stippled, rippled, hammered, patterned, chipped, crackled, cathedral, etc., depending upon the particular type of surface.

Prismatic Glass - A clear glass into whose surface is fabricated a series of prisms, the function of which is to direct the incident light in desired directions.

Antique Glass - A glass of relatively smooth surface having a slight degree of non-uniform diffusion due to the intentional presence of bubbles, striae, fissures, etc.

Transparent Glass - Glasses falling under this classification have no apparent diffusing properties. Such glasses are sometimes referred to as flint, crystal, clear.

This Nomenclature of Illuminating Glasses is a part of the progress report of the Joint Committee on Illuminating Glasses. The membership of this Committee was selected from the personnel of the Illuminating Engineering Society, the Illuminating Glassware Guild, and the Glass Division of the American Ceramic Society.

MONAX

A large quantity of light is no longer synonymous with good lighting. Rather it is the proper quality and directing of the light which produces good illumination. An uncovered light source of high intensity, even though it gives off considerable light, may actually cause the observer to see less effectively because of the glare resulting from the high intensity direct rays from the source. The correction for this difficulty lies in properly diffusing the light; that is to say, breaking up the light rays by means of a diffusing glass in such a way that, instead of coming from a small concentrated light source such as a lamp filament, the light will appear to emanate from a large, uniformly and less intensely bright, source--the enclosing globe or shade. At the same time it is desirable that as great a percentage of the light as is possible with good diffusion be transmitted through the glass.

The properties of perfect diffusion and very high transmission efficiency, coupled as they are in MONAX, result from

a proper balance of the ingredients which can be obtained only by using materials of previously unheard-of purity. Very careful search has been made for sources of supply of raw materials free from impurities. To make doubly sure that all undesirable material is kept out of the batches, every shipment of raw materials received at the factory is subjected to a rigid chemical and physical examination. The composition of the glass also is rechecked by means of chemical analyses of the finished product. A trained staff of chemists and physicists exercise a careful supervision of every stage of the manufacture.

Careful selection of the materials which go into MONAX would avail but little if exceedingly great care were not exercised in the melting and in the other operations incident to its manufacture. The manufacture of MONAX for illuminating purposes may well be likened to the manufacture of optical glass for telescopes, etc., from the standpoint of the exactness and careful attention to detail which insure a final product that meets the high standards which have been set and maintained. In the melting of glass, slight deviations from the established proper temperature schedule may result in a product of entirely different properties than those desired. The melting of MONAX batches is very carefully controlled and a constant check and record of the melting temperatures is made by means of a series of recording temperature-measuring instruments. These recording instruments are checked for accuracy each day with the aid of special standard instruments.

After the glass has been melted and examined to see that it is free from striations, stones and other defects, it is ready to be gathered and blown. The work of shaping the glass into the many familiar forms in which MONAX is available is done by blowers whose many years of experience have given them the skill and adeptness necessary to obtain the proper distribution and thickness of glass in the finished ware.

The desired form and size of the ware is obtained by blowing the glass, which has been gathered on the end of the blowing pipe, out into a mould. The hot plastic glass, as it strikes the mould surface, is necessarily chilled and the chilling strains thus set up would materially weaken the ware if they were not properly relieved. This is accomplished by passing the glass through annealing ovens called lehrs, the temperature of which is accurately controlled in such a way as to cause the glass to cool down very slowly.

When the glass comes out of the lehr, it is taken to the finishing department. Every piece of ware is examined to make certain that it is finished to the correct fit and that it will hang properly when suspended. The glass is given a final selection for freedom from all possible defects. The ware is examined over a lamp of the size with which it will be used in service and defective ware sorted out and destroyed. The

glass which meets high quality selection standards is then ready for packing and shipping.

MONAX possesses the following outstanding characteristics:

- 1 - Exceptionally high efficiency coupled with perfect diffusion
- 2 - Strength
- 3 - Attractive appearance
- 4 - Ease of maintenance
- 5 - Resistance to weathering

This combination of properties is responsible for the position of MONAX as being unexcelled in the illuminating glass field.

MONAX has, upon repeated tests, been shown to be a perfect diffuser and has furthermore been found to absorb less light than any other glass of equal diffusive ability.

MONAX is a homogeneous glass and is consequently much stronger than many varieties of the so-called cased glasses on the market. One layer of a cased glass is usually white diffusing glass while the other is clear glass. With each glass having its own co-efficient of expansion (i.e., the amount it expands or contracts upon heating or cooling, respectively), strains are repeatedly being set up in the glass by the alternate heating and cooling in service, causing the glass to weaken and eventually break. MONAX is a single layer, homogeneous glass, and consequently does not have the weakness inherent in cased glasses.

In appearance MONAX is just as attractive by day as when lighted at night. It is distinguished by a fine color tone. By reflected light it has an attractive, characteristic lustre, typical of only MONAX. The chalky, dead white appearance found in many opal glasses has been eliminated. By transmitted light, on the other hand, the glass fills up with light to a uniform brightness and does not, like some glasses, allow the filament of the incandescent lamp to show through as tiny wires of fiery red.

MONAX presents no roughened surface on either the inside or outside and hence dirt and dust are not readily deposited upon it. It is furthermore highly resistant to atmospheric weathering, consequently maintaining its original smooth surface and permitting easy cleaning.

IVORIAN

The basic ingredients of IVORIAN are largely those of MONAX except for the addition of certain elements which produce an ivory tone. The delicacy of color, suggesting real ivory rather than cream or yellow tones, has stamped IVORIAN

the outstanding glass of so-called "ivory" types. It is manufactured with the same care and under the same rigid specifications which characterize the processes previously described.

GALAX

There has been a gradual but constant increase in the amount of light considered essential for comfortable vision and for the accurate and efficient performance of work under artificial illumination. What was considered sufficient illumination for a given task just a few years ago is now known to be far from adequate. Thus levels of illumination have been stepped up.

In meeting this demand for more and more illumination, the incandescent lamp manufacturers have improved the efficiency of lamps and have produced more lamps of higher wattage. Whereas not many years ago the 100 watt lamp was considered a high wattage lamp, 500, 750 and 1000 watt lamps are now commonly used for interior illumination. To retain all the benefits of increased levels of illumination without experiencing the detriments otherwise incident to the use of such excessively dazzling and glaring light sources, the glass manufacturer must provide a housing or enclosure suitable for these larger lamps.

Glass manufacturers have used various approaches to the solution of this problem with only partial success. The one piece enclosing globe suggested itself quite naturally as being the effective way of making a really dust proof unit whose initial efficiency could be easily and economically maintained. The enameled bottom unit, in which the light source was shielded by means of a heavy white enamel over the bottom of the one piece enclosing globe, made its appearance and attained a considerable vogue. This unit met the dust proof requirement but proved to be impractical because of the difficulty of obtaining an enamel which satisfactorily maintained its reflecting properties. Particularly in sulphurous atmospheres, the enamel quickly blackened and the illuminating efficiency of the unit was permanently impaired. Such enamels also take on a moist film (like weathered glass) which tends to hold dust and dirt. Furthermore, difficulty was experienced in preventing the enamel from cracking and chipping off after a short period of use, thus destroying the appearance of the unit.

The above enumerated practical obstacles confronted the glass manufacturer in attempts to solve the problem of efficient semi-indirect lighting by these more obvious methods of approach. This was the situation which existed when our glass technologists conceived an entirely new and revolutionary method. This idea, developed by careful and systematic research, has found its culmination in GALAX, a semi-indirect

lighting glass which overcomes the disadvantages common to earlier forms of this type of lighting unit.

GALAX Semi-Indirect Lighting enclosing globes are one piece units having all the dust proof advantages of this type of globe. While of homogeneous composition throughout, they are characterized by a dual opacity. The bottom part of the globe is of a dense white reflecting opal which effectively eliminates the glare of the high wattage lamps and efficiently reflects the light upward towards the ceiling. The top portion of the globe is of a light opacity, slightly diffusing to eliminate lamp filament and fitter shadows, and is of exceptionally high transmission. Thus the light reflected from the bottom is permitted to gain free and unrestricted exit towards the ceiling from which it is diffusedly reflected.

On occasions a product may more closely be described by explaining what it is not rather than what it is. Because of the revolutionary nature of GALAX and its dissimilarity to any other illuminating glassware, it is felt that this is true of GALAX. For example, a GALAX globe is not enameled and hence suffers neither the deterioration of reflecting efficiency nor the tendency to crack and peel off which characterizes the enameled globe. It is not a cased or multi-layer globe, and there is consequently no danger that the several layers may part and the globe may crack. GALAX globes are not two piece units, but consist of a single piece of homogeneous glass, and are relatively dust proof, thus enabling them to maintain their initial efficiency.

Briefly describing the methods of obtaining this dual density in a homogeneous globe, let us start with the character of the glass when it is blown. In its original form the entire globe of GALAX glass is of the light opacity of the top portion of the finished product. After it has been blown into shape and removed from the mould, but before it has been detached from the blow pipe, the globe is partially inserted in a very hot circular oven or dropped through an aperture only slightly greater than the minimum diameter of the globe being treated. Thus, this intense heat reaches only the lower portion of the globe, that portion which is to retain its original density remaining outside the furnace aperture. The heat causes the character of the glass in the lower hemisphere of the globe to change from its original light opacity to dense white reflecting opacity.

The result of this treatment is a homogeneous GALAX globe having dual density. While primarily designed to be a glare reducing unit possessing low surface brightness and producing a most comfortable illumination, a GALAX globe possesses a truly remarkable illuminating efficiency for a semi-indirect lighting unit. The distribution characteristics of GALAX globes disclose a most desirable division of upward and downward components of light for semi-indirect lighting in that

over 70% of the light is directed upward towards the ceiling and less than 30% is thrown downward.

DENAX

DENAX is a dense, white, highly reflecting, solid opal glass which has been developed especially for use in a rapidly increasing field of luminous-indirect lighting units where it is desirable to reflect a greater percentage of impinging light and at the same time transmit a small amount. Both the reflected and transmitted light are very highly diffused.

DENAX is used primarily for bowls, shallow dishes and other glass articles where reflected light is of primary importance and only a small amount of light is required to be diffused through the glass itself.

Most DENAX articles with which we are familiar have been produced by pressing rather than blowing. Since there is no blow pipe to which a pressed article is attached, and the entire surface area requires the heat treatment, the process is slightly different from a GALAX globe in that DENAX glassware is placed in an oven lehr and treated uniformly at a high temperature to bring out the required reflecting opacity or density.

DENAX glass because of its high reflecting and low surface brightness qualifications has been instrumental in reviving the popularity of luminous-indirect lighting glassware to a very marked degree. The desired effects would not have been possible with white glass, such as the ALBA or MONAX types, because of the high intensity of the lamps now in use. In the early stages of this development there was presented a choice of two courses, producing a white glass of high brightness or a dense glass of low brightness. Naturally the latter course was adopted since it more closely approximated the ideal results.

In the production of a glass of this character, particularly of the thickness necessary, it will take on natural color values. Dense glass provides a warm tone which will fit into almost any luminous-indirect lighting scheme. This tone was adopted after thorough consideration of the psychology of color in relation to restful lighting, the lamp, in most installations of this character, being placed rather close to the bowl. It is most essential that the glass provide low surface brightness, and to keep within the limits of good lighting usage in this respect necessitated a slight increase of depth in the color. This color, however, has practically no effect on the color of the useful light since only about 4% passes through the glass itself. Of course, since reflected light will naturally take on the tones of the walls and the ceiling, it is necessary for this particular form of illumination that they be treated with colors that will absorb as little and reflect as much of the light as possible.

The particular process used in pressing DENAX bowls, involving the elimination of the ring, results in a smooth strengthening rounded edge instead of the sharper offset produced with a ring in pressing. This method is generally known as free pressing.

All things considered, there is no doubt in our mind that DENAX is the best medium for luminous-indirect bowls where it is desirable to keep the surface brightness to a minimum and produce the high percentage of reflected light with a quality of transmitted light having a restful color value.

Repeated tests have proved the exceptionally high efficiency of DENAX as compared with many of the metals common in use today for reflecting purposes as well as certain types of clear glass to which have been applied treatments resulting in reflecting surfaces.

LUMITE

There are upon the market today many types of clear glass rather generally characterized as crystal, but varying in color through ranges of green, amber, purple and bluish-gray, dependent upon the character and varying degrees of purity of ingredients used in the batch. Some of these glasses are quite brittle, others tend to discolor when exposed to the bright sunlight or to develop a film from atmospheric weathering.

In our laboratories, glass technicians were faced with a problem of developing a clear glass with high luster, resistant to weathering and discoloration from long exposure to the rays of the sun. Such a glass has been developed and is being produced under the name LUMITE.

Recognizing the increasing use of higher intensity lamps, LUMITE has greater qualities of heat resistance than found in ordinary clear glass.

Tensile strength combined with the qualities enumerated above characterize LUMITE as an outstanding glass for use in the manufacture of globes for street lighting, architectural lighting glassware and in fact any type of lighting where a strong, clear glass may be required.

ALVAX

ALVAX is a homogeneous glass of light opacity, which has found wide application when only a slight diffusion and relatively high transmission of light are desired. A rich silk-like texture renders it especially attractive in appearance. It is particularly adaptable for the manufacture of heavy pressed ware.

PROCESSES OF DECORATION

The several kinds of illuminating glasses previously described are all adaptable to a variety of decorative treatments. Some may be deeply etched by acid or sand-blasted with designs ranging from simple lines to quite intricate patterns. In glasses suitable for deep etching, the application of colors or iridescent lustres may be combined to produce beautiful effects. Other glasses may be successfully used in the production of a lighter surface etching or a very light acid treatment which merely removes certain portions of applied color to form a particular decorative design.

When color is used in the processes just described it is usually fired on the surface of the glass prior to the etching treatment, but if applied after etching it is also fired on the glass; in fact, the successful use of applied color on glass necessitates firing at a temperature sufficiently high to cause the color to become a part of the glass and to insure not only permanency but indefinite maintenance of the original tones. Decorative motifs may be applied directly to the glass in color by a process of printing and filling-in which results in shading and toning effects not ordinarily obtained by etching. These colors are fired as described above.

Experienced decorators apply many designs by hand in color as well as with silver, gold, platinum and aluminum.

GENERAL SPECIFICATIONS AND LIMITATIONS

When planning the use of glass for illumination, it should be determined first whether or not it is practicable to obtain the desired results by available processes of manufacture, finish and decoration. What type of glass is best suited for the purpose? Can the color required be obtained either in the glass or by application? To approximately what temperature will the glass be subjected in use?

In architectural elements of clear or clear matted finish glass, should:

- (a) The ends and (or) sides have ground surface?
- (b) The ends and (or) sides have ground and polished surface?

(Note: Ordinary grinding is satisfactory in clear or matted finish when appearance of the joint in design is not important or is covered with metal. Grinding and polishing is usually required when joints are minimized in the design.)

- (c) Back and (or) face have clear mould finish?
- (d) Back and (or) face have ground and polished finish?
- (e) Back and (or) face have matted finish?

There are certain definite limitations of size and thickness in glass manufacture. These should be determined before specifications are prepared. All tolerances required for successful production should be established in advance.

Ideas for possible fixtures are presented in the pages which follow. These sketches are not intended to represent definite designs of complete lighting fixtures. Corning Glass Works does not design, manufacture or sell metal parts of lighting fixtures.

HOME LIGHTING

The average American home is poorly lighted. The human eye was originally evolved for outdoor seeing. Nature on a bright sunny day gives us ten thousand foot candles of illumination in unshaded areas and under a clouded sky or in shaded areas, as much as six hundred foot candles. Either provides very comfortable light for reading, yet we attempt to read at night in our homes with two and three foot candles of illumination. This abuse of our eyes is a very important factor in the increase of defective vision with age as found by the United States Public Health Service through a comprehensive survey.

Harmonious decorative effects, combined with adequate illumination, may be obtained by the use of glass. The problem is to recognize that various rooms of the house are used for different purposes and to analyze each accordingly. Good lighting will make the house so much more livable!

Porch Lighting

The charm of a carefully planned home is first revealed in its entrance. Since lighting requirements for the porch or entrance are relatively simple, the selection of the proper lighting unit should, to a large extent, be dependent upon its decorative or architectural harmony with the building. The lighting task for the fixture is to guide the guest to the home and to welcome him. A pair of diffusing glass bracket lights on either side of the door, or a single lighting unit above the door, will adequately illuminate the entrance. A diffusing glass luminaire on the ceiling of the porch will increase the usability during the evenings. A unit recessed to light the steps and prevent accidents is well worth its cost. Illuminated house numbers are very desirable. Convenience outlets in the inside wall above the area where rain and snow cannot reach them are desirable for portable lamps and for decorative lighting at holiday seasons. Side and rear entrances should have individual luminaires; a single unit over the door usually is sufficient. Care should be taken that the metal of these fixtures will withstand the weather. The sketches show suggested types of fixtures for porch and entrance lighting.

Entrance Hall

Since an entrance hall in the average American home is usually rather small, a suspended type of glass lantern is suggested. It should be hung sufficiently high for normal head and door clearance. The employment of highly diffusing glass is recommended. An entrance hall is an excellent place to use concealed lighting around the mirror, illuminated niches and other novel lighting effects expressing the hospitality being extended to the guest. The seeing task in the hall is rather simple and requires little light.

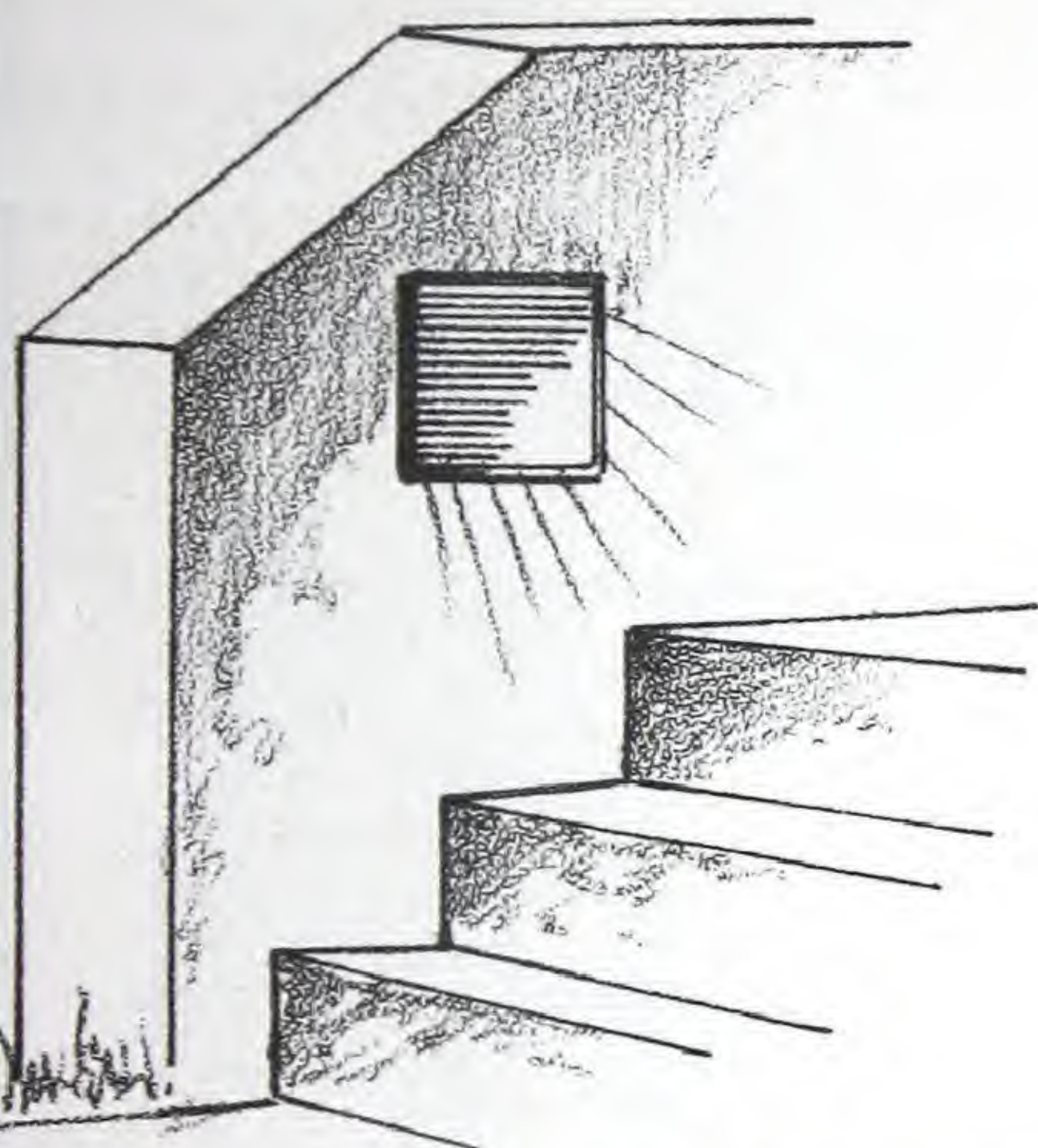
— HOME-LIGHTING-PORCH —



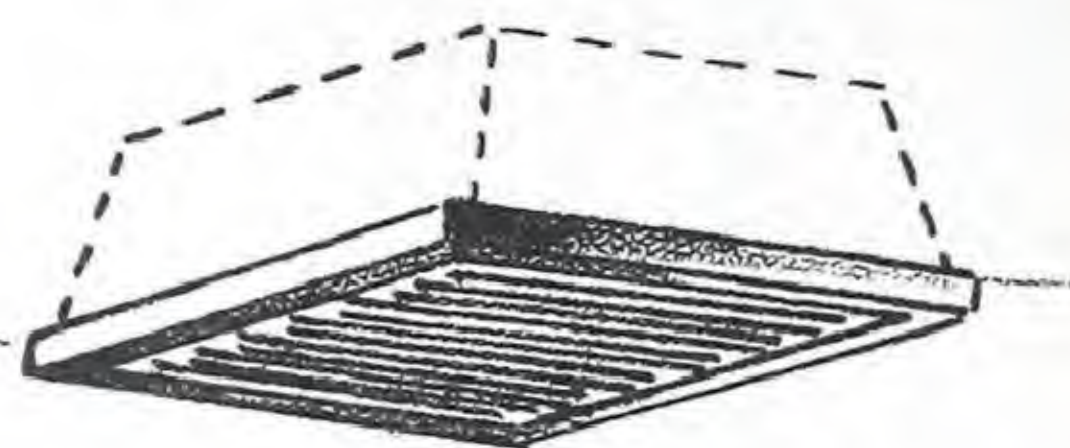
— #12112 - LUMITE - SQUARE - BOWL —
— 8 $\frac{15}{16}$ " SQUARE - 2 $\frac{11}{16}$ " DEEP —



— CEILING-LIGHT —



— STEPS - CAN - BE - LIGHTED - BEST - WITH —
— #12108 - PLATES - BUILT - INTO - THE —
— DES - OF - THE - PORCH - IN - A - MANNER —
— THAT - WILL - DIRECT - THE - LIGHT —
— WHERE - IT - IS - MOST - NEEDED. —



— #12108 - PLATE - WITH - METAL —
— FRAME - AND - RECESSED - BOX - IS —
— EXCELLENT - FOR - LOW - CEILINGS —



— CEILING-LIGHT —

← 6 $\frac{1}{2}$ " →



↑ 6 $\frac{1}{2}$ " ↓

— #12108 —
— LUMITE - OR - ALVAY —
— ILLUMINATING - PLATE —
— $\frac{1}{4}$ " - THICK —

— ROUND-MONAX-BOWLS —



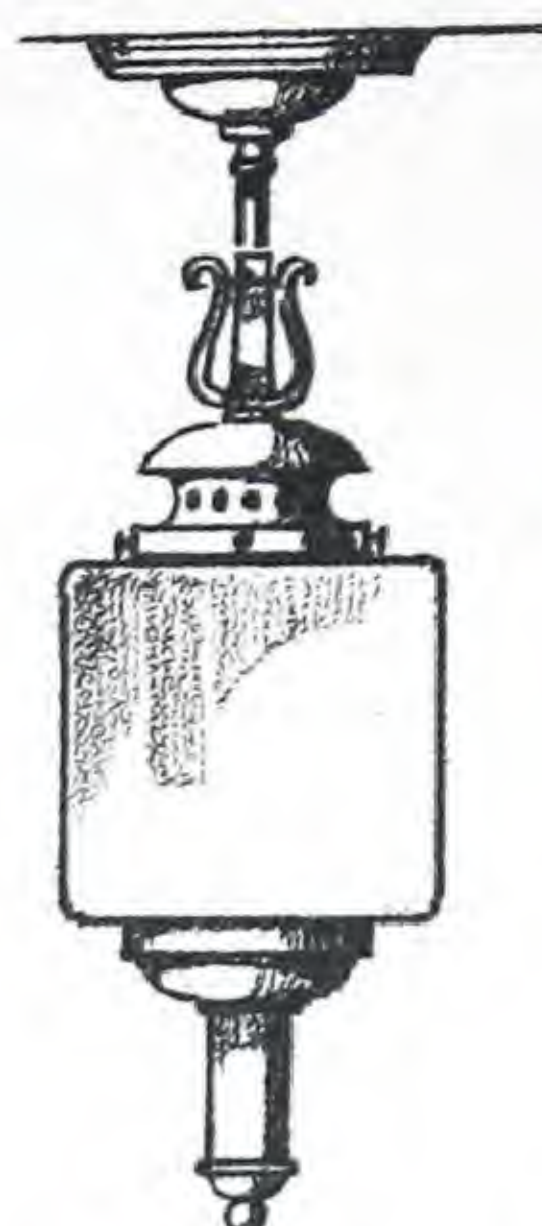
— #12192 - 8" DIA - 3" DEEP -
— #12146 - 10" DIA - 3 $\frac{1}{2}$ " DEEP -
— #12147 - 12" DIA - 4" DEEP -
— #12148 - 14" DIA - 4 $\frac{1}{2}$ " DEEP -
— #12195 - 16" DIA - 5" DEEP -
— DRILLED - $\frac{1}{2}$ " - CENTER - HOLE -

— HOME · LIGHTING · PORCH —

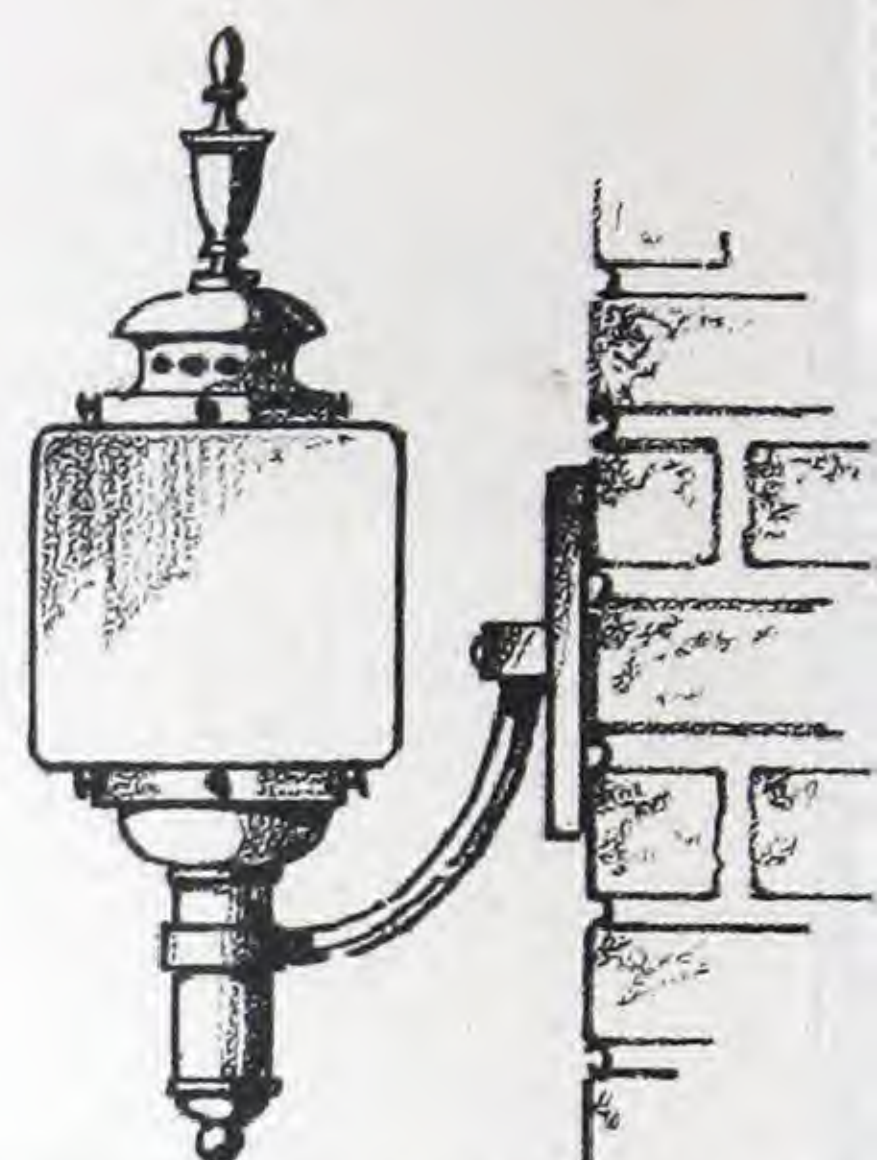


MONAX CUBES

- # 12087 - 4 3/8" Sq. 3/4" FITTER —
- # 2347 - 6" Sq. 3/4" " —
- # 12089 - 7" Sq. 4" " —
- # 12088 - 8" Sq. 4" " —



— CEILING · LIGHT —



— WALL · BRACKET —

- A · COACH · TYPE · LANTERN · WITH
- A · MONAX · CUBE · WILL · ENHANCE
- THE · ENTRANCE · OF · ALMOST
- ANY · HOME —

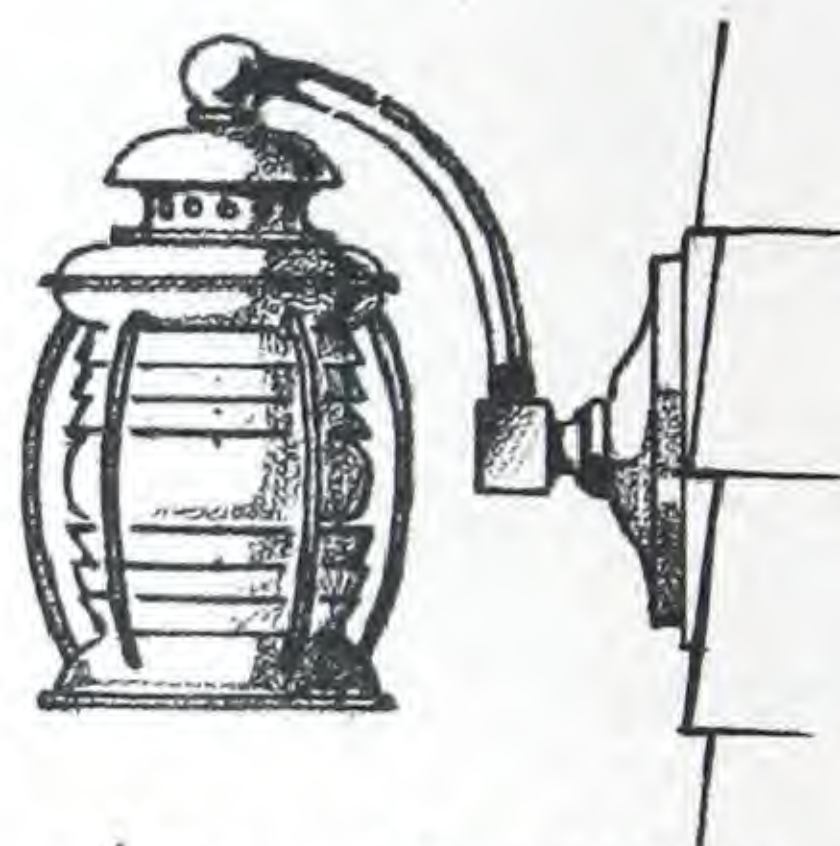


— CEILING · LIGHT —



— # 5842 —

- FRESNEL TYPE GLOBE —
- LUMITE GLASS —
- 4" DIA. 4 1/2" HIGH 3/4" FITTERS —



— WALL · BRACKET —



- # 4270 · D120 —
- AMBER · ANTIQUE · GLASS —
- BLACK · RIBS · AND · GREEN —
- DIAMONDS —
- 6 1/4" DIA. · 7 3/8" HIGH —
- 3/4" FITTER —



CEILING LIGHT

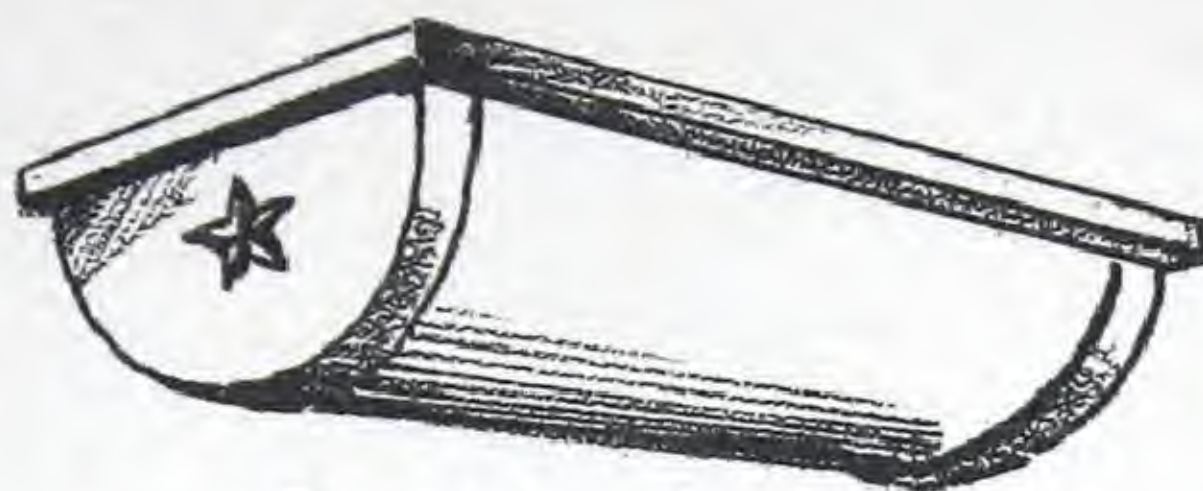


— WALL · BRACKET —

— HOME LIGHTING - PORCH —



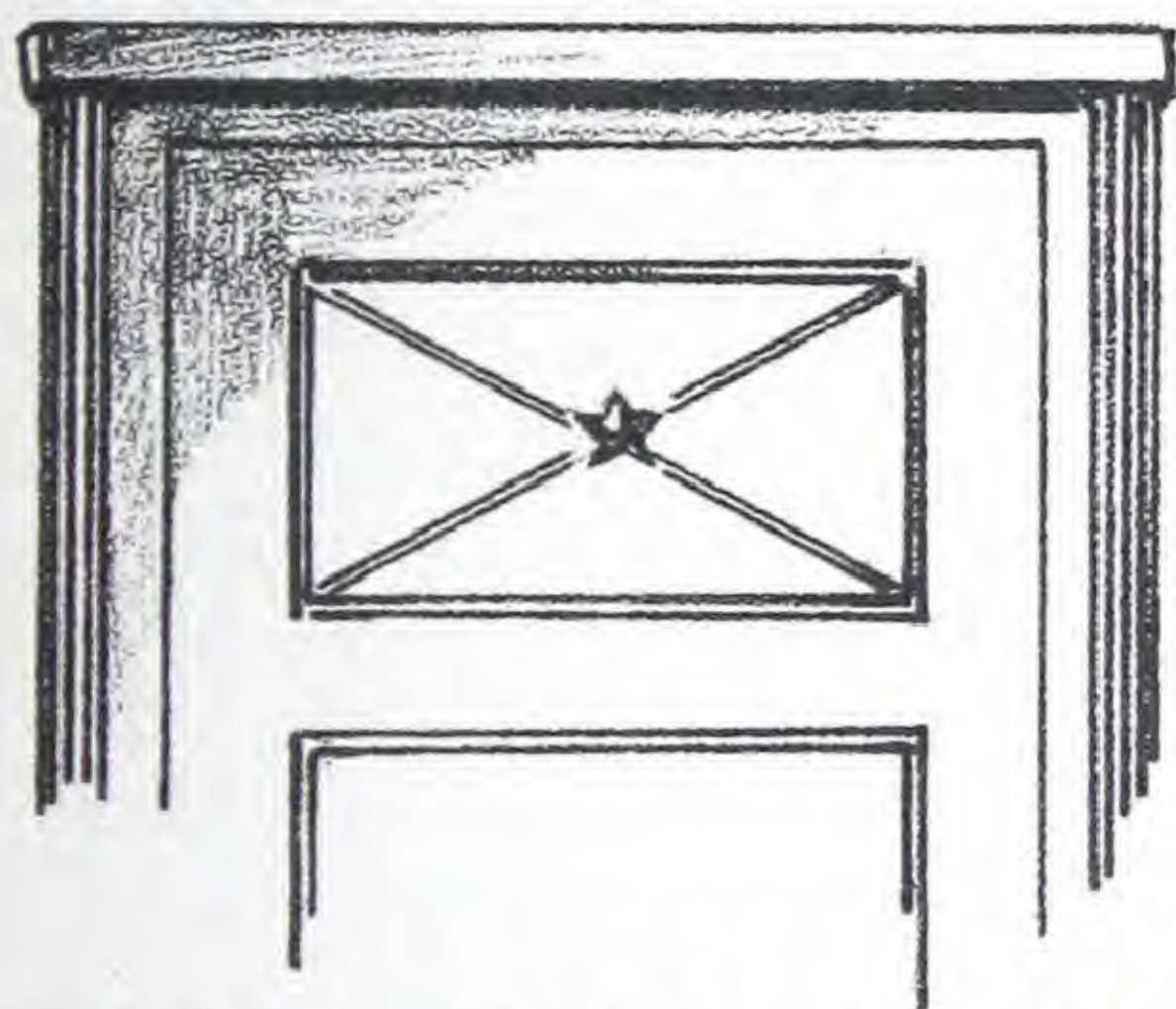
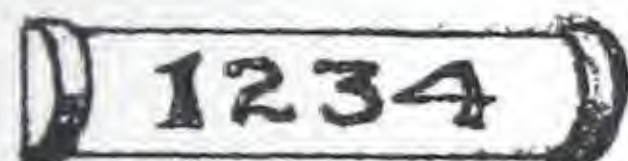
— WALL - LIGHT —
— USING - SHORT —
— HALF - CYLINDER —



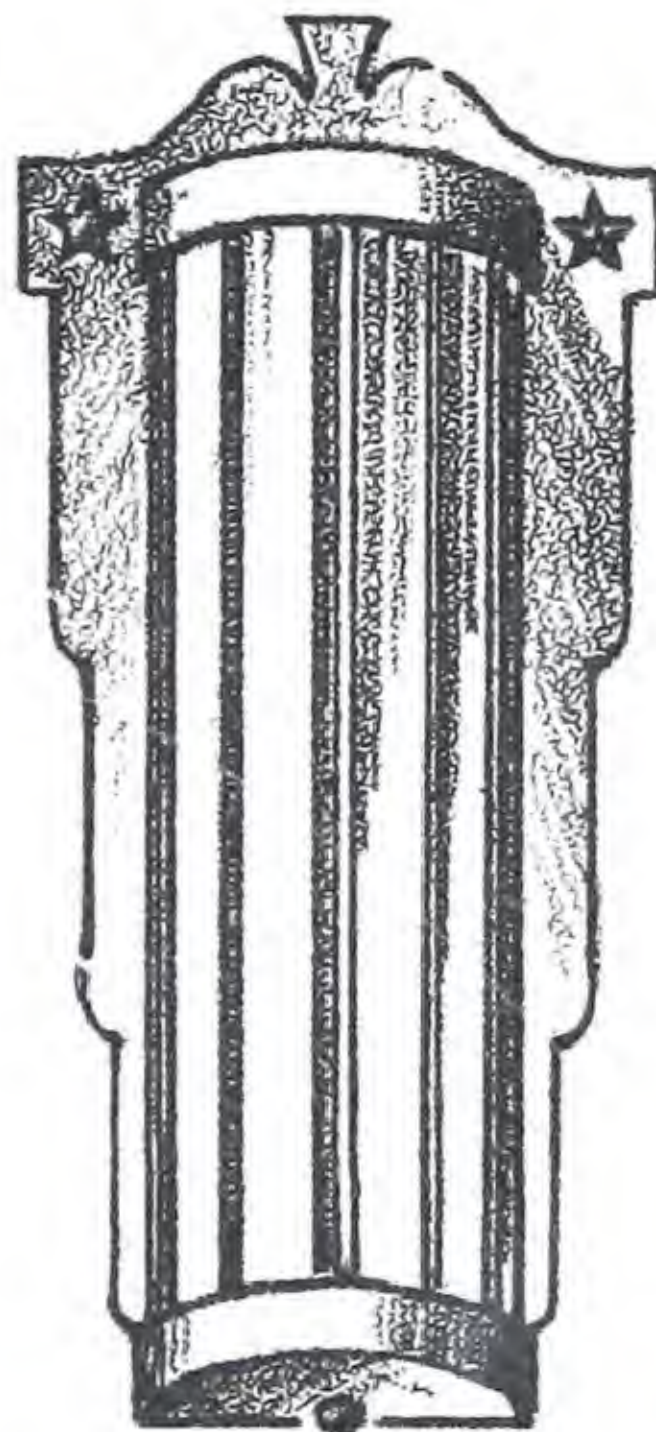
— CEILING - LIGHT —
— USING - HALF - CYLINDER —



— SIMPLE - WALL —
— LIGHT - USING —
— HALF - CYLINDER —



— A - HALF - CYLINDER - WITH —
— HOUSE - NUMBER - PAINTED —
— ON - IS - A - VERY - EFFECTIVE —
— WAY - TO - TREAT - THE - MODERN —
— ENTRANCE - DOOR —



— WALL - LIGHT —
— WITH # 12133 —
— FLUTED - TROUGH —



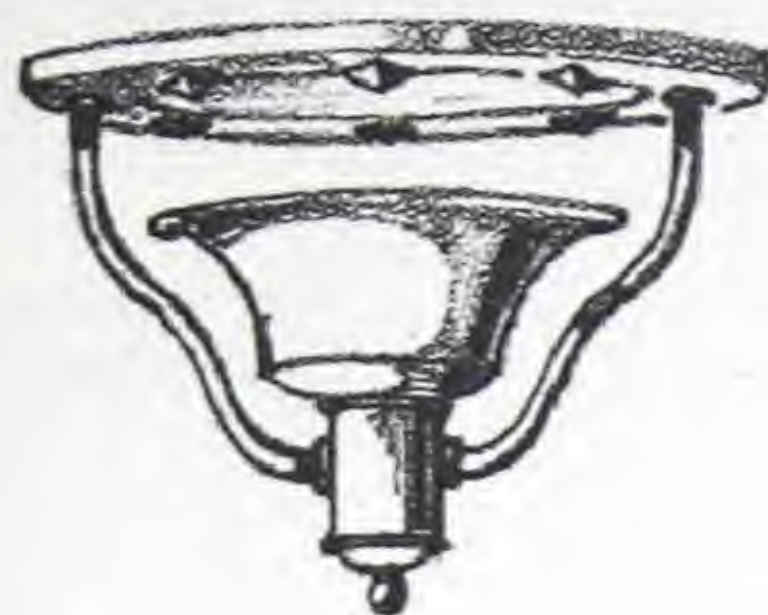
— # 12133 —
— FLUTED TROUGH —
— 6 3/4" WIDE —
— 18 3/4" MAX LENGTH —
— 4 1/6" DEEP —
— LUMITE GLASS —



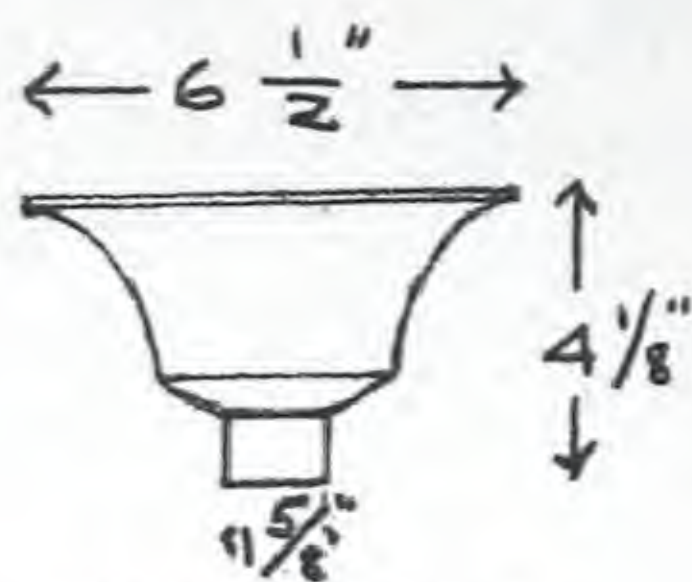
MONAX HALF CYLINDERS			
DIA.	LENGTH	DIA.	LENGTH
2"	21"	6"	21"
2 1/2"	14"	7"	16"
3"	18"	8"	26"
3 1/2"	14"	10"	18"
4"	19"	12"	36"
4 1/2"	32"	13 5/8"	28"
5"	16"		

— SHORTER - IF - SPECIFIED —

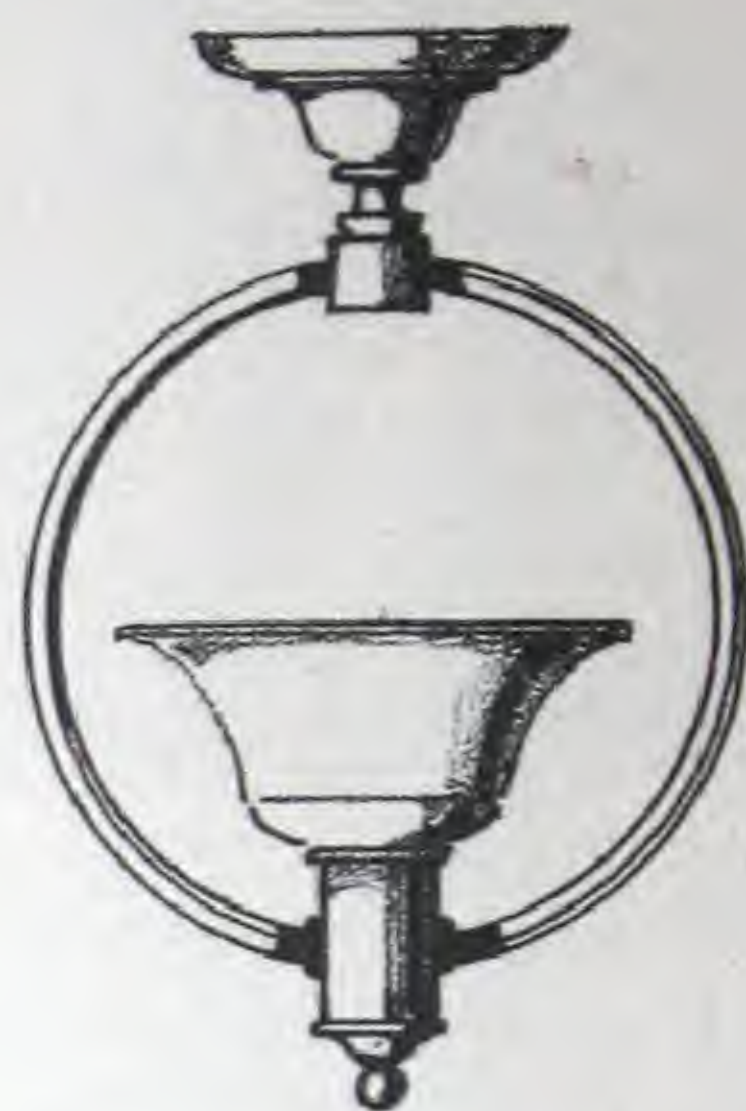
— HOME-LIGHTING — ENTRANCE-HALL —



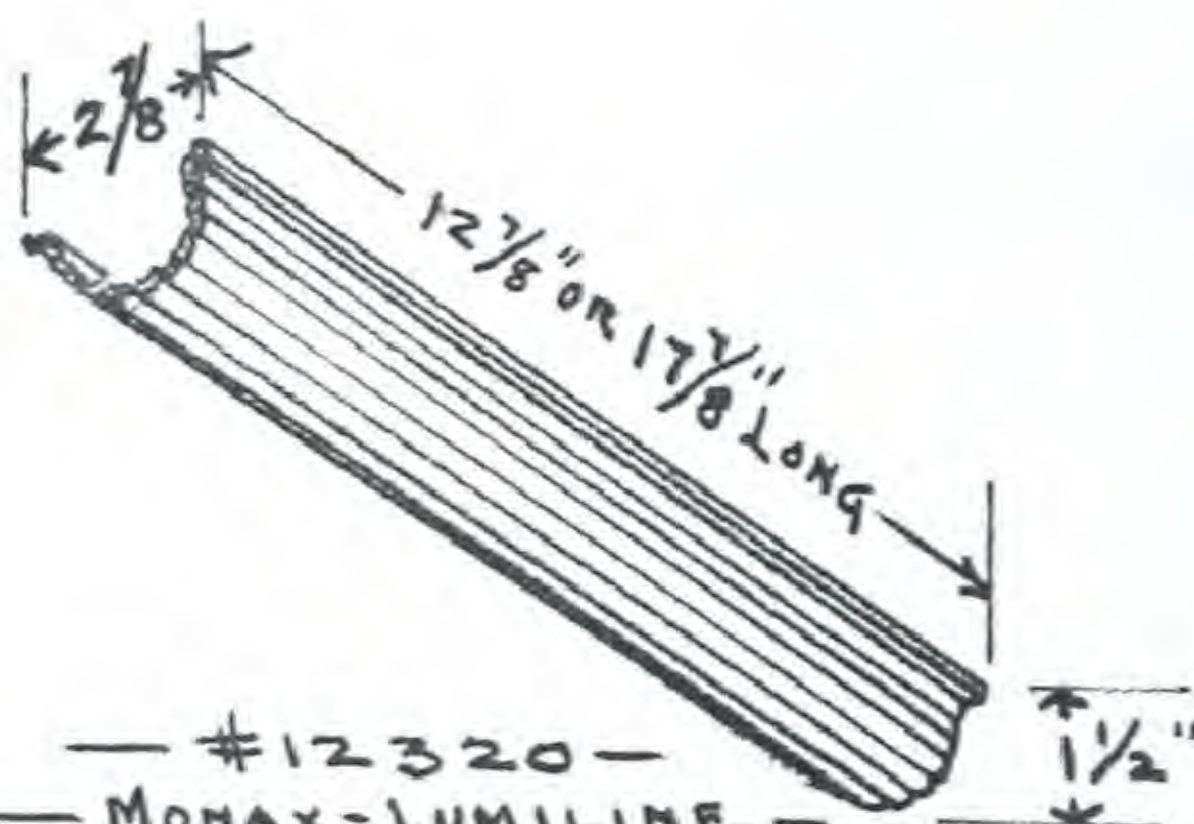
— CLOSE-UP-TYPE —
— FOR-LOW-CEILINGS —



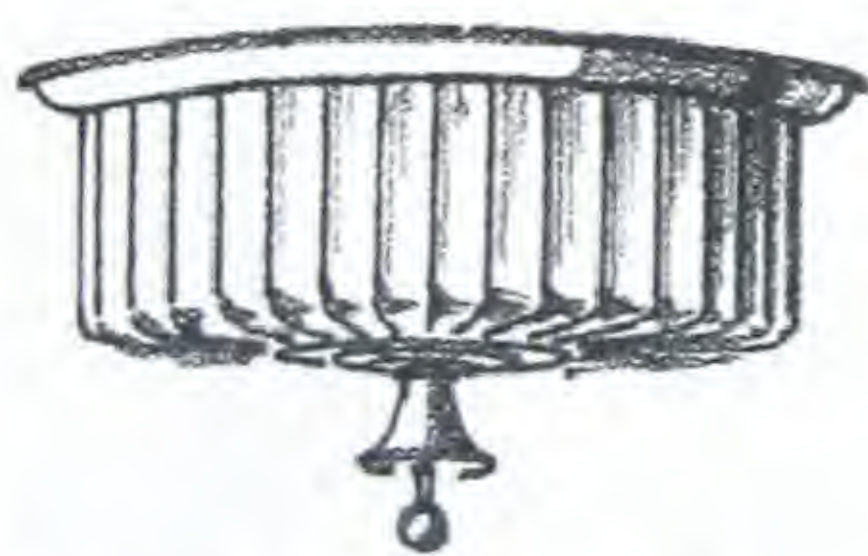
— #1969 A —



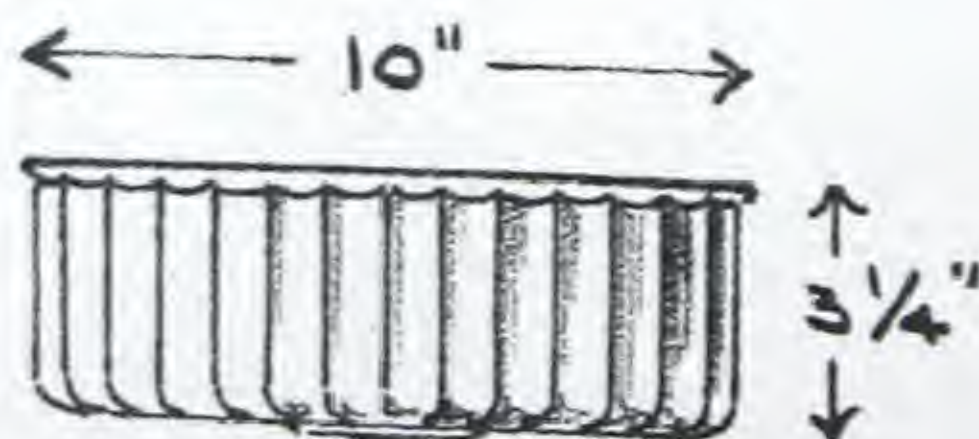
— FOR-HIGHER-CEILINGS —



— #12320 —
— MONAX-LUMILINE —
— STRIP —



— R-FLUTED-BOWL-FOR —
— LOW-CEILINGS —



— #12359 —
— ROUND-FLUTED-BOWL —
— IVORIAN GLASS —
— DRILLED-1/2" CENTER-HOLE —

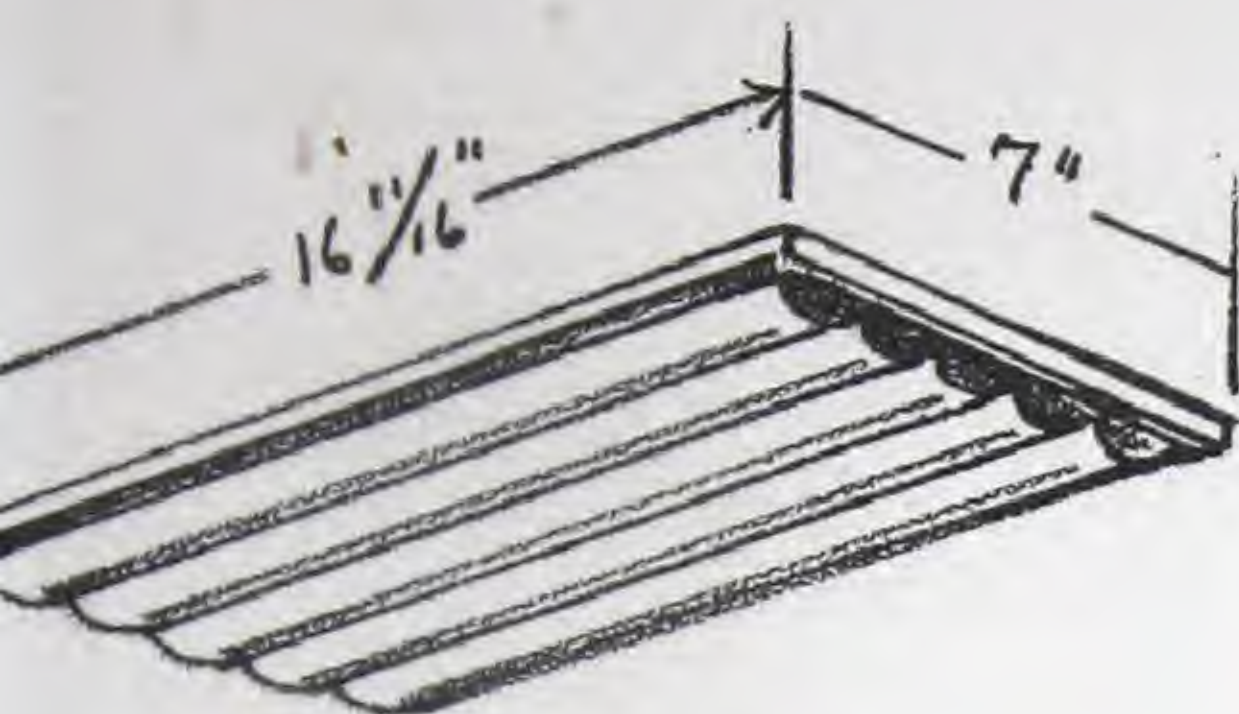


— #12320-USED —
— AS-NICHE-LIGHT —

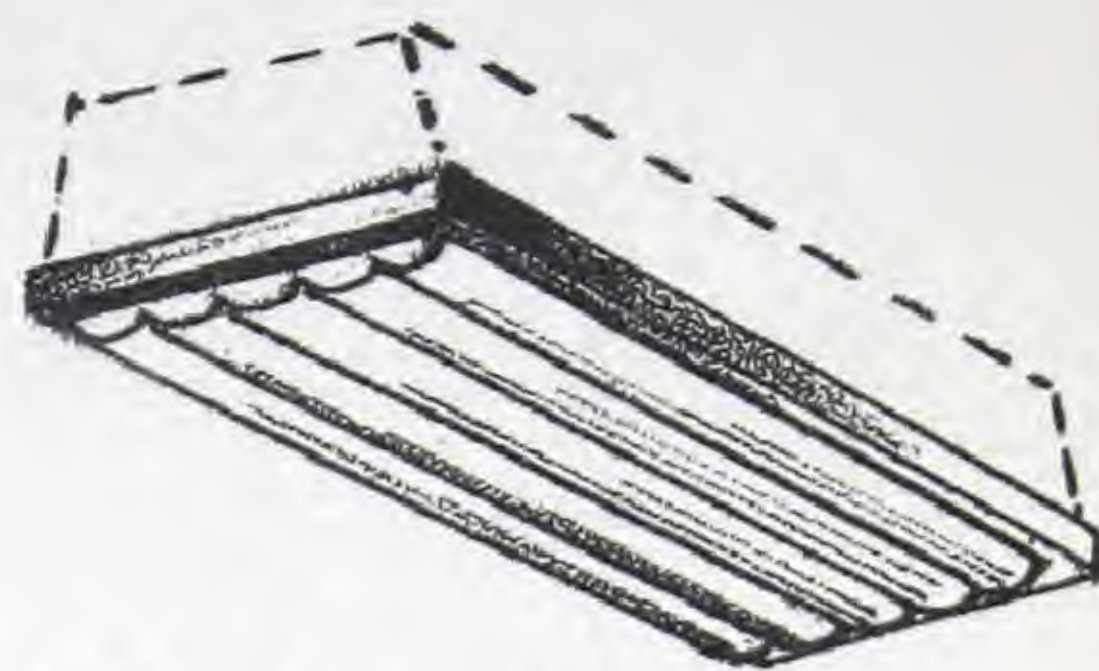


PLAN-OF-NICHE LT.

— HOME-LIGHTING — ENTRANCE-HALL —



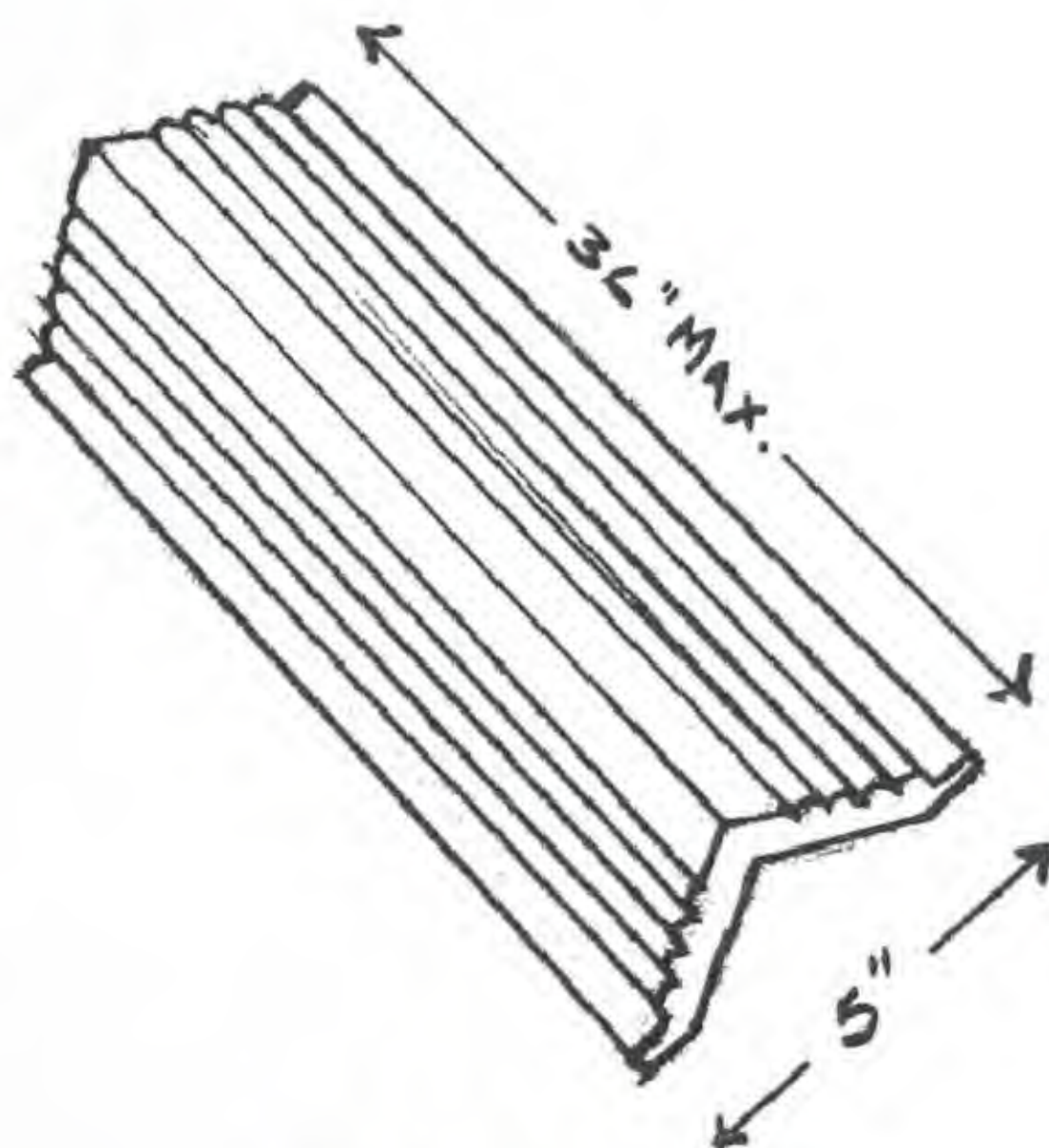
12128
— LUMITE · SATIN · FINISH —
— OR · AMBERTONE · —



— RECESSED · BOX —
— FOR · LOW · CEILINGS —



— ROUND LANTERN —
— WITH CYLINDER —



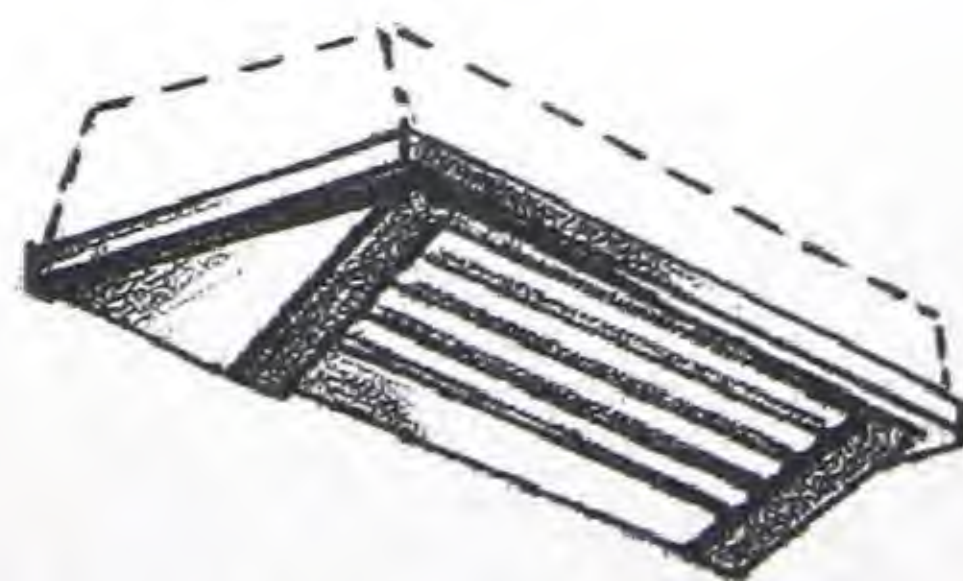
— # 2038 —
— CLEAR · OR · FROSTED —
— 2" · DEEP —



— WALL · BRACKET —



CYLINDERS
— SEE ANTIQUE · OR · MONAX —
DIA. LENGTH
4" 6"
6" 8"
8" 10"
10" 12"
— TABLE · ONLY · IN —
— THESE · SIZES —



— RECESSED · BOX —
— FOR · LOW · CEILINGS —

Living Room

The lighting in the living room should be very flexible. It is the most important room in the home and one in which the visual tasks vary considerably. Low levels of illumination are acceptable for tasks requiring no great visual exercise. Higher levels of local lighting are desirable for reading, study and other similar activities. A high general illumination is necessary for games or other recreational activities requiring visual exercise.

Ceiling fixtures should be provided to give general illumination throughout the room when needed. Luminous indirect type glass is preferable when the room height and a good reflecting ceiling permit its use. If the ceiling is low, either a close fitting type of diffusing glass luminaire or luminous cove lighting will produce attractive and efficient illumination.

An adequate number of convenience outlets should be provided to allow the use of portable lamps in reading and work areas. "I.E.S." Better Sight Lamps are especially recommended. The white diffusing glass used in these lamps provides excellent illumination and no brightness contrasts so injurious to eyesight - particularly that of children. These lamps are available in many types and designs and may be obtained with variable illumination.

The arrangement of a good ceiling light plus a number of portable lamps will afford a flexible and excellent lighting scheme for this very important room.

— HOME-LIGHTING-LIVING-ROOM —



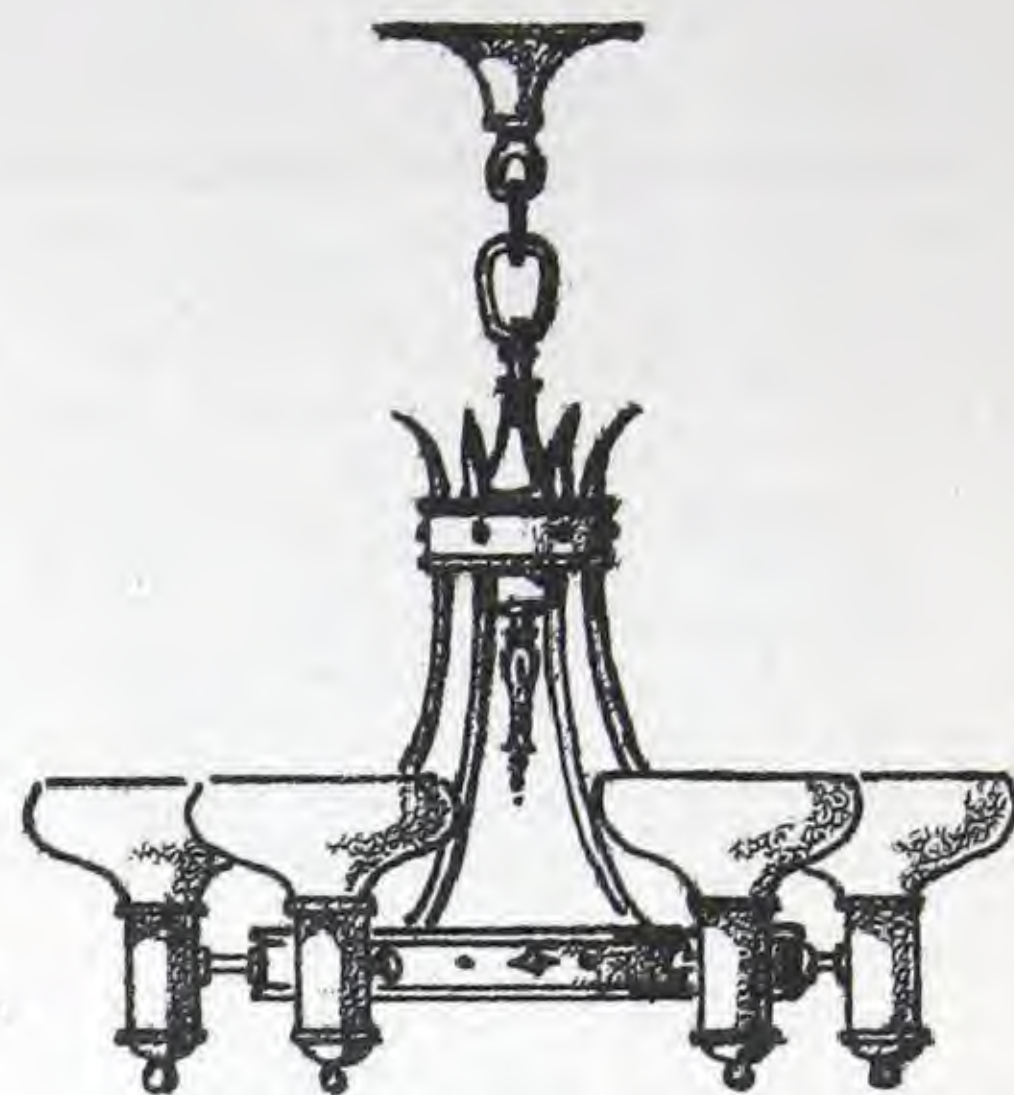
- #12191A —
- 6 1/16" DIA. —
- 3" DEEP. —
- 1 5/8" FITTER —
- DENAX-OR- —
- IVORIAN-GLASS —



- 2-LIGHT —
- WALL-BRACKET —



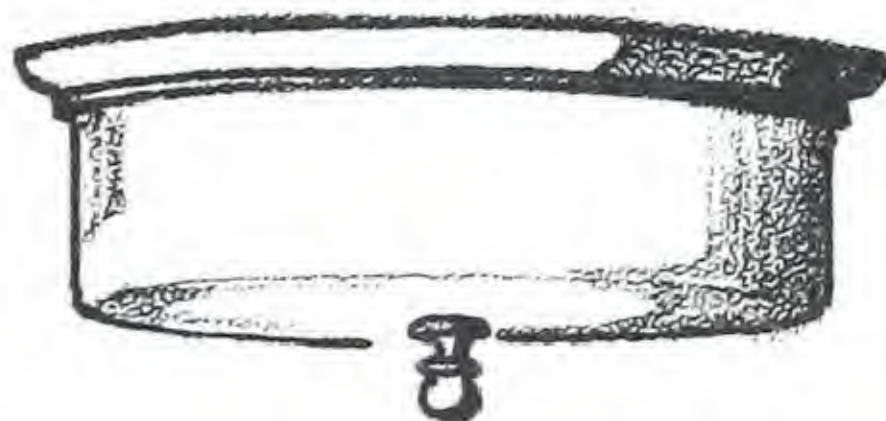
- 1-LIGHT —
- WALL-BRACKET —



- 5-LIGHT —
- CEILING-FIXTURE —



- SUSPENDED-TYPE —
- FOR-HIGHER-CEILINGS —



- FOR-LOW-CEILINGS —

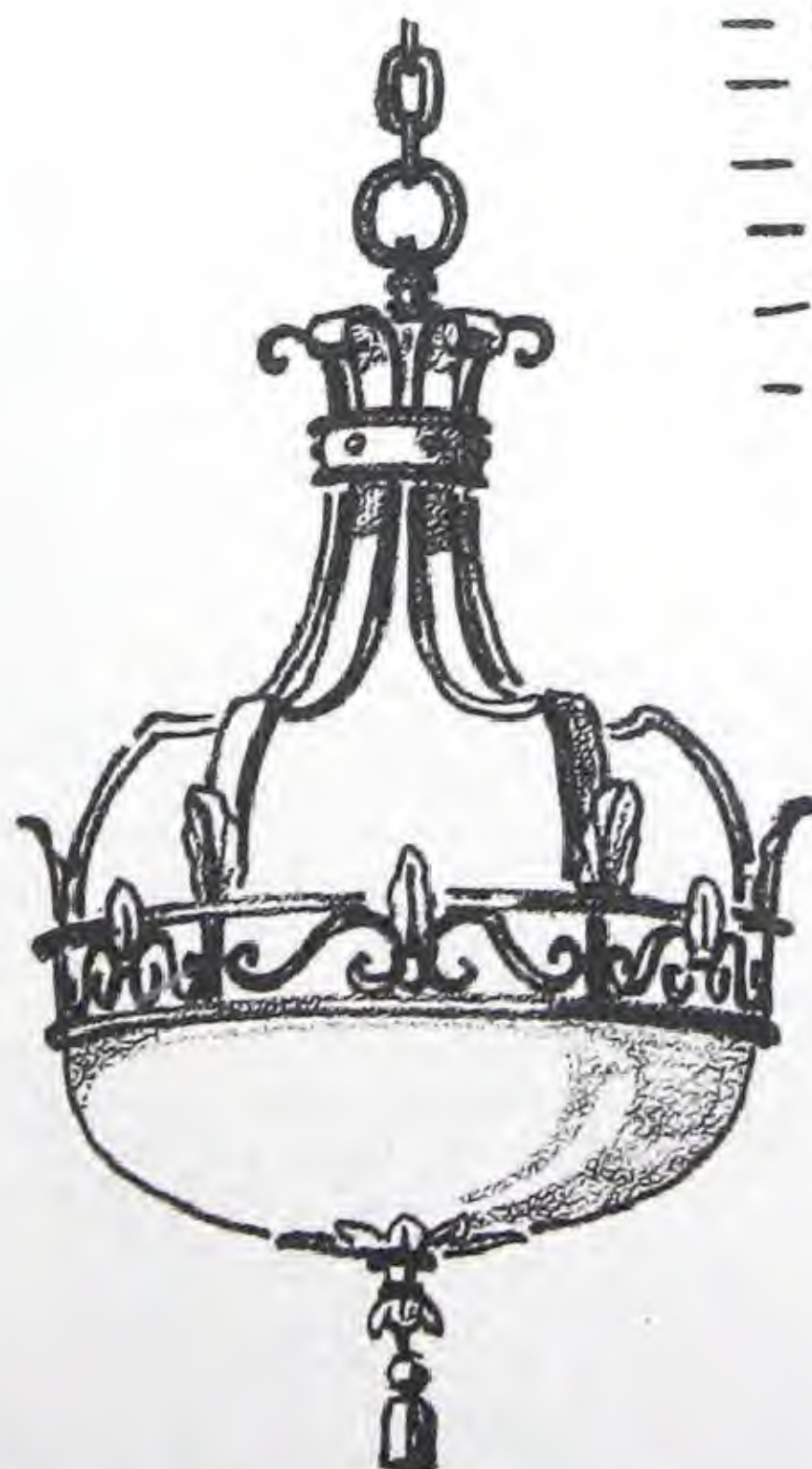


ROUND-MONAX-BOWL

- 12192 8" DIA. — 3" DEEP —
- 12146 10" DIA. — 3 1/2" DEEP —
- 12147 12" DIA. — 4" DEEP —
- 12148 14 1/4" DIA. — 4 1/2" DEEP —
- 12195 16" DIA. — 5" DEEP —
- DRILLED-1/2" CENTER-HOLE —
- AVAILABLE-IN-IVORIAN-GLASS —



- ROUND-MONAX-BOWLS
- 9007 - 8" DIA. — 3 1/8" DEEP —
- 4999 - 10" DIA. — 3 1/8" DEEP —
- 5012 - 12" DIA. — 3 3/4" DEEP —
- 5013 - 14 1/4" DIA. — 4 7/16" DEEP —
- 5014 - 16" DIA. — 5" DEEP —
- DRILLED-1/2" CENTER-HOLE —



- SUSPENDED-TYPE —
- FOR-HIGHER-CEILINGS —



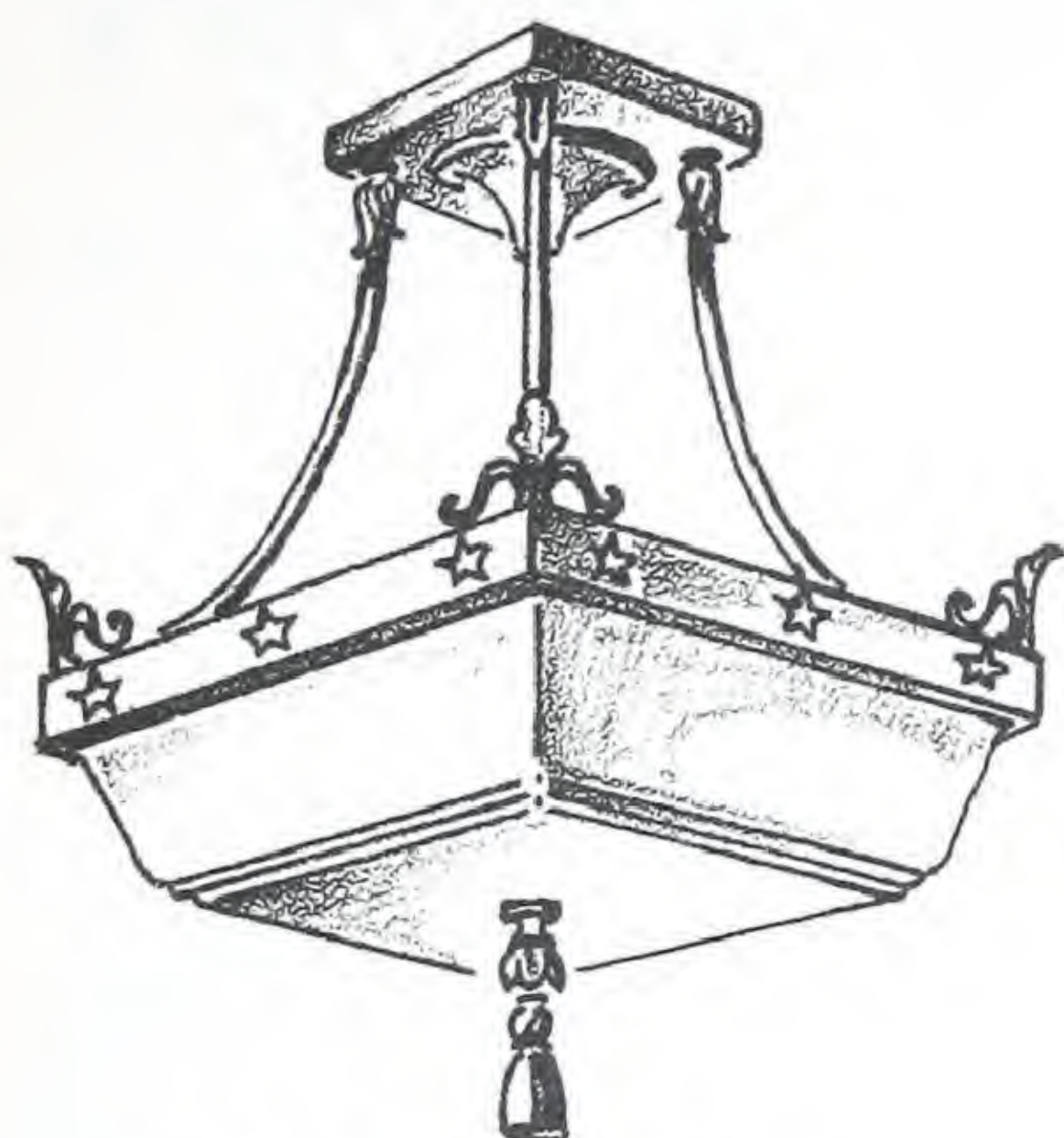
- CLOSE-UP
- FOR LOW CEILINGS

— HOME LIGHTING - LIVING ROOM —

- # 5893 - DENAX - ON - A —
- FLOOR - STANDARD —
- PROVIDES - EXCELLENT —
- ILLUMINATION - OVER —
- A - WIDE - AREA —



— CEILING - LIGHT —



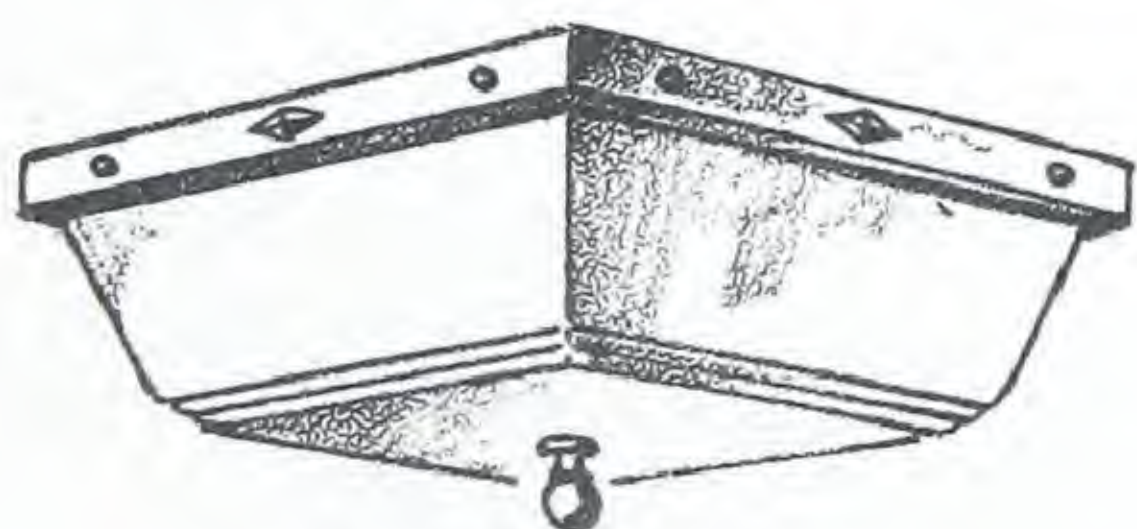
— SUSPENDED —
— CEILING - LIGHT —



— SUSPENDED —
— CEILING - LIGHT —



— # 5893 - DENAX —
— 11 1/4" DIA. - 8" HIGH —
— 1 1/8" DIA. BOTTOM HOLE —



— CLOSE - UP —
— CEILING - LIGHT —

- WHITE - OR —
- LIGHT - IVORY —
- CEILING —
- WILL - GIVE —
- BEST - LIGHTING —
- RESULTS —



— SUSPENDED —
— CEILING - LIGHTS —

- SQUARE - BOWLS —
- MONAX - OR - LUMITE - SATIN —



- # 12174 - D172 —
- IVORY - 8 - PINK - DECORATION —
- 11" DIA. - 5 3/4" DEEP —
- DRILLING - AS - SPECIFIED —

- # 12142 — 10 3/4" Sq - 3 3/4" DEEP —
- # 12143 — 12 3/4" Sq - 4 1/2" DEEP —

— HOME LIGHTING — LIVING ROOM —

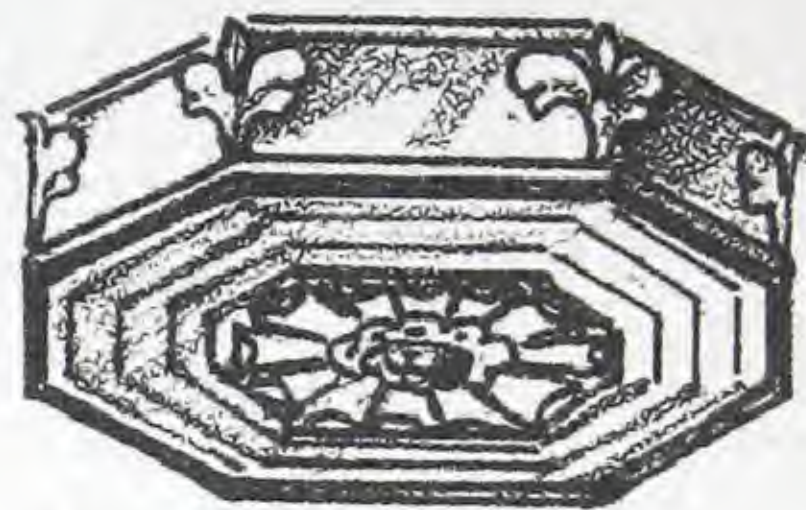


— SUSPENDED —
— CEILING-LIGHT —

← 13 $\frac{3}{4}$ " →



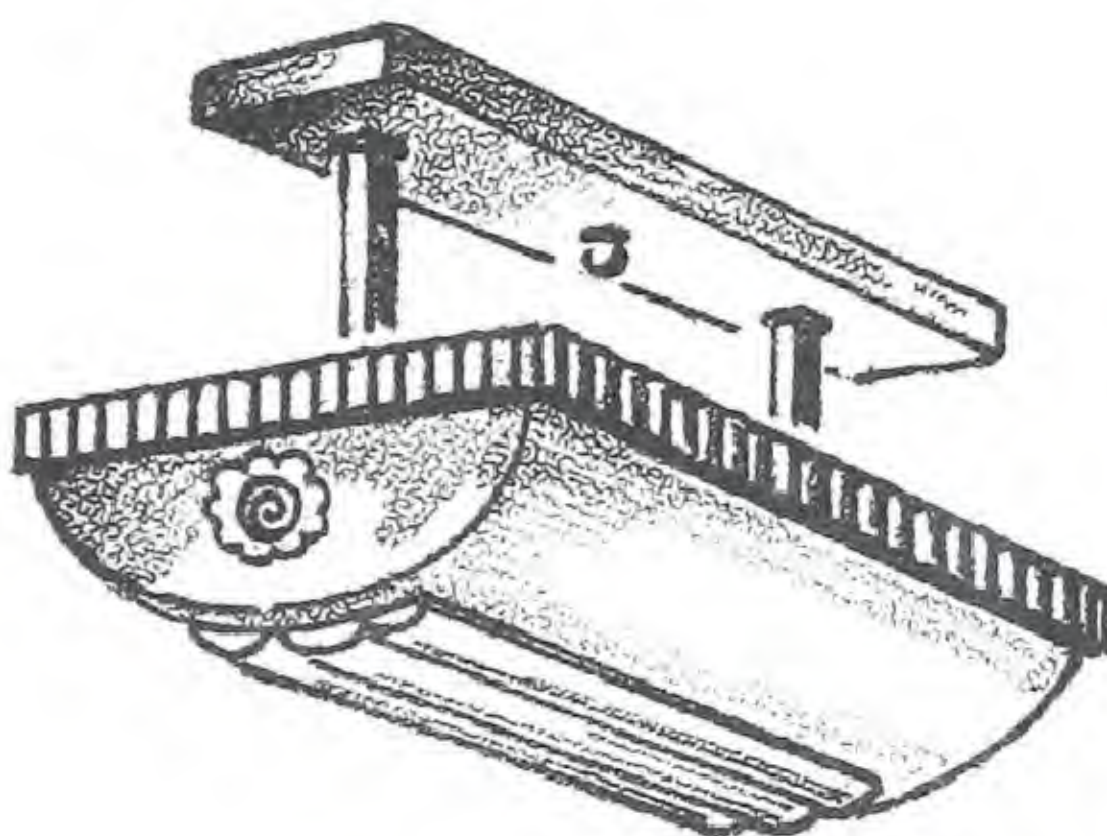
— # 2009 —
— CLEAR-OR-FROSTED —



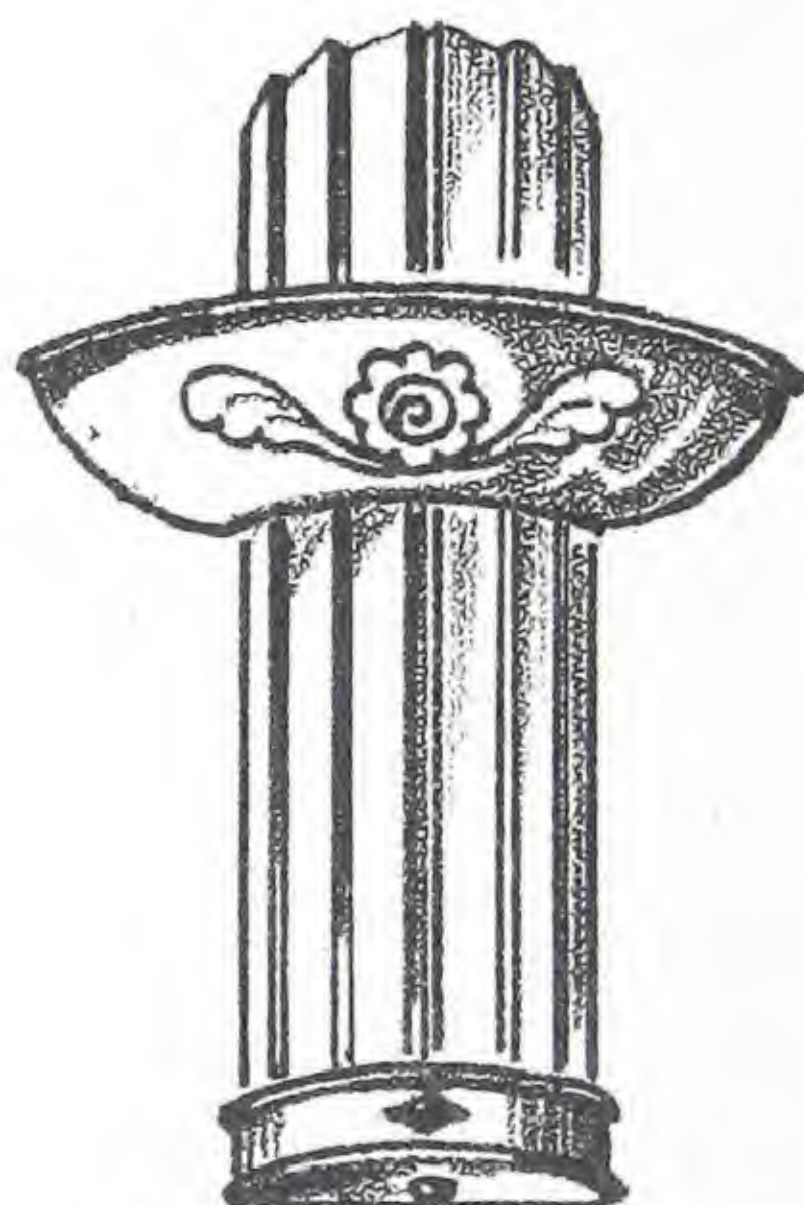
— CLOSE-UP-TYPE —
— FOR-LOW-CEILINGS —



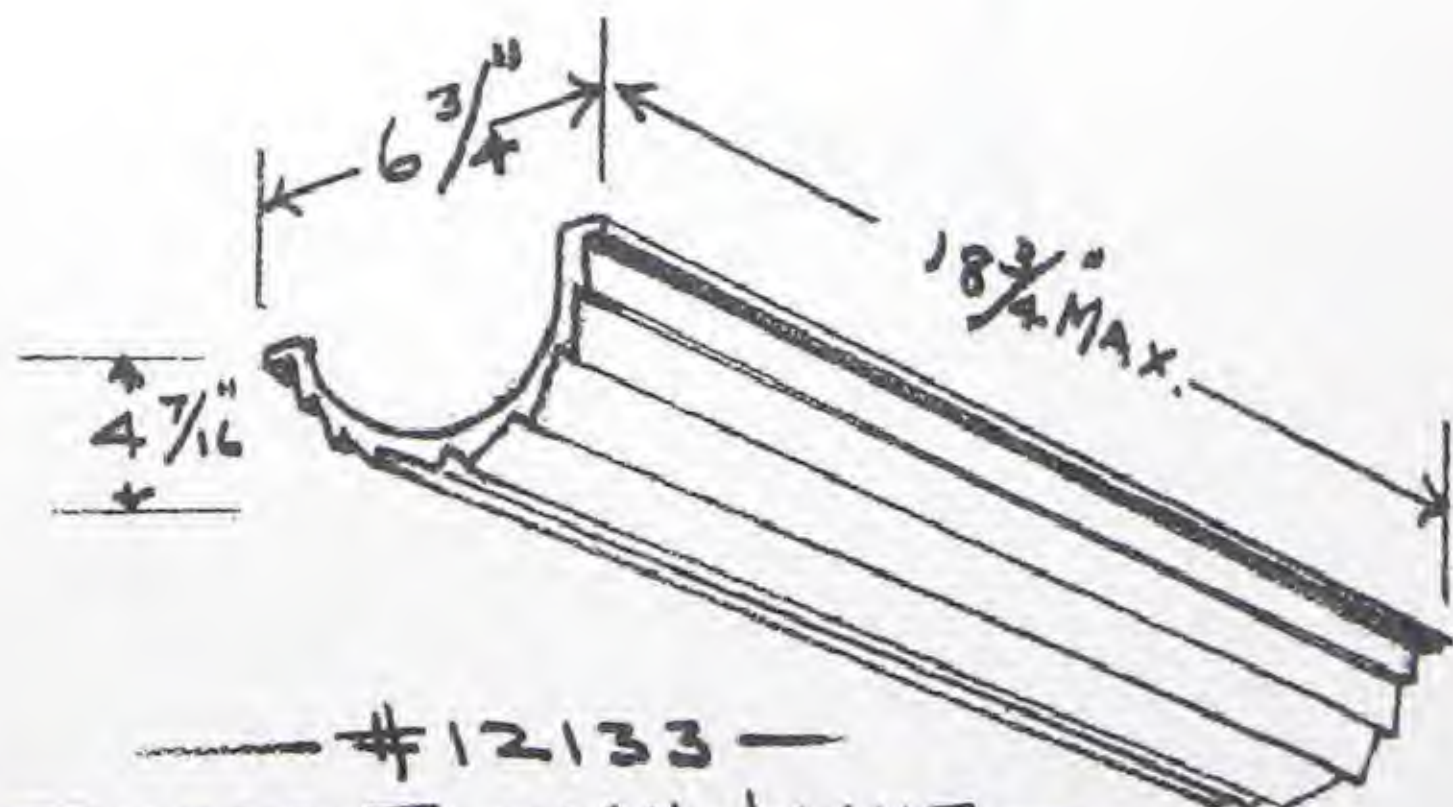
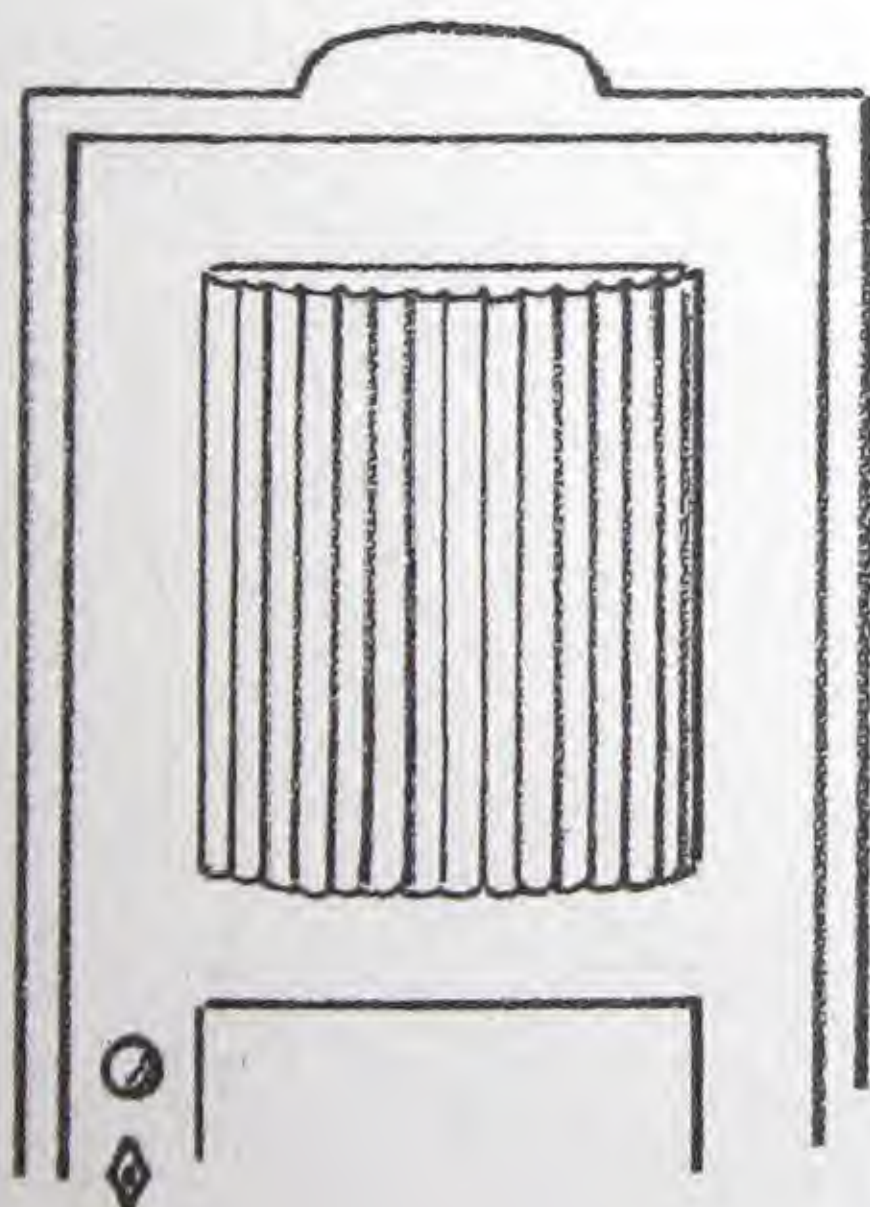
— # 12129 —
— LUMITE-SATIN —
— OR-AMBERTONE —



— CEILING —
— LIGHT —

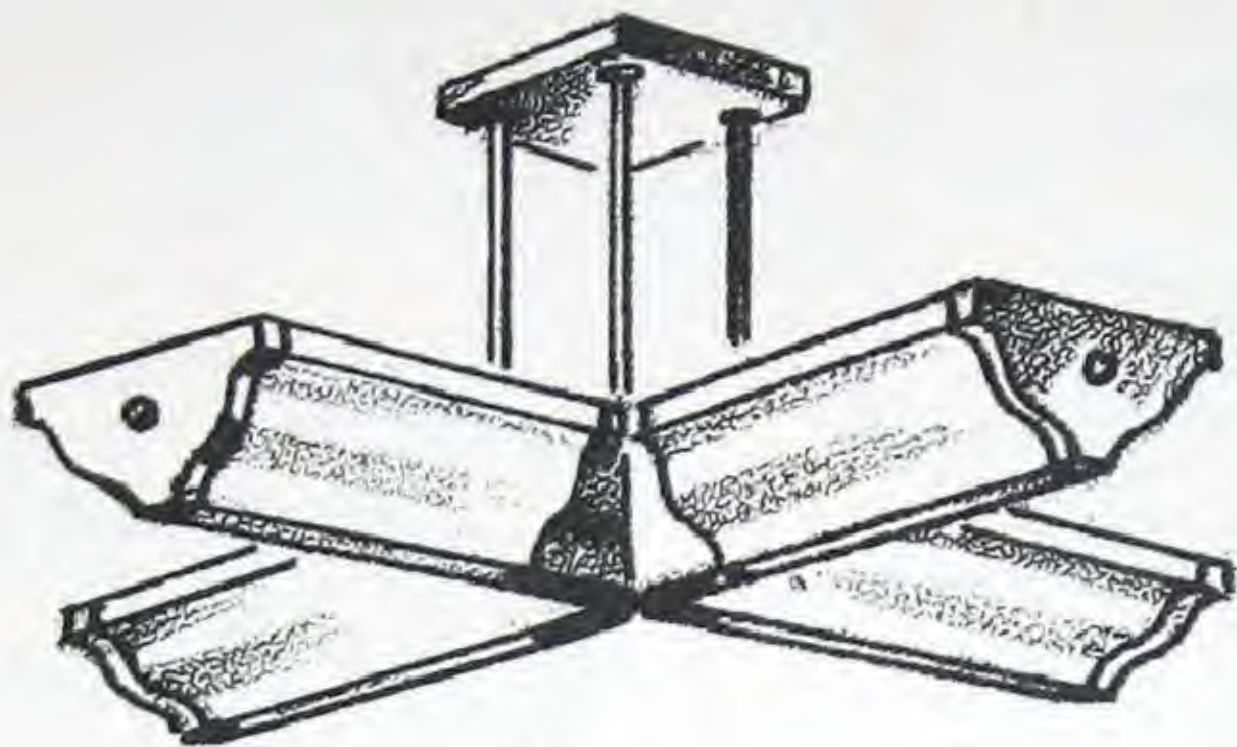


— WALL-BRACKET —

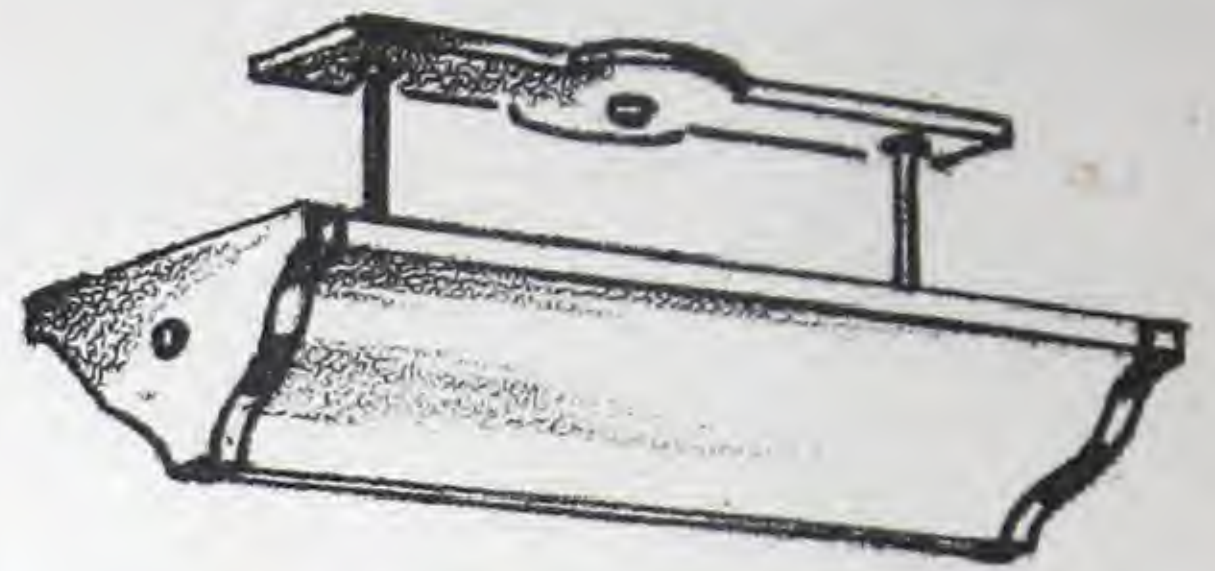


— # 12133 —
— FLUTED-TRough-LIGHT —
— LUMITE SATIN OR AMBERTONE —

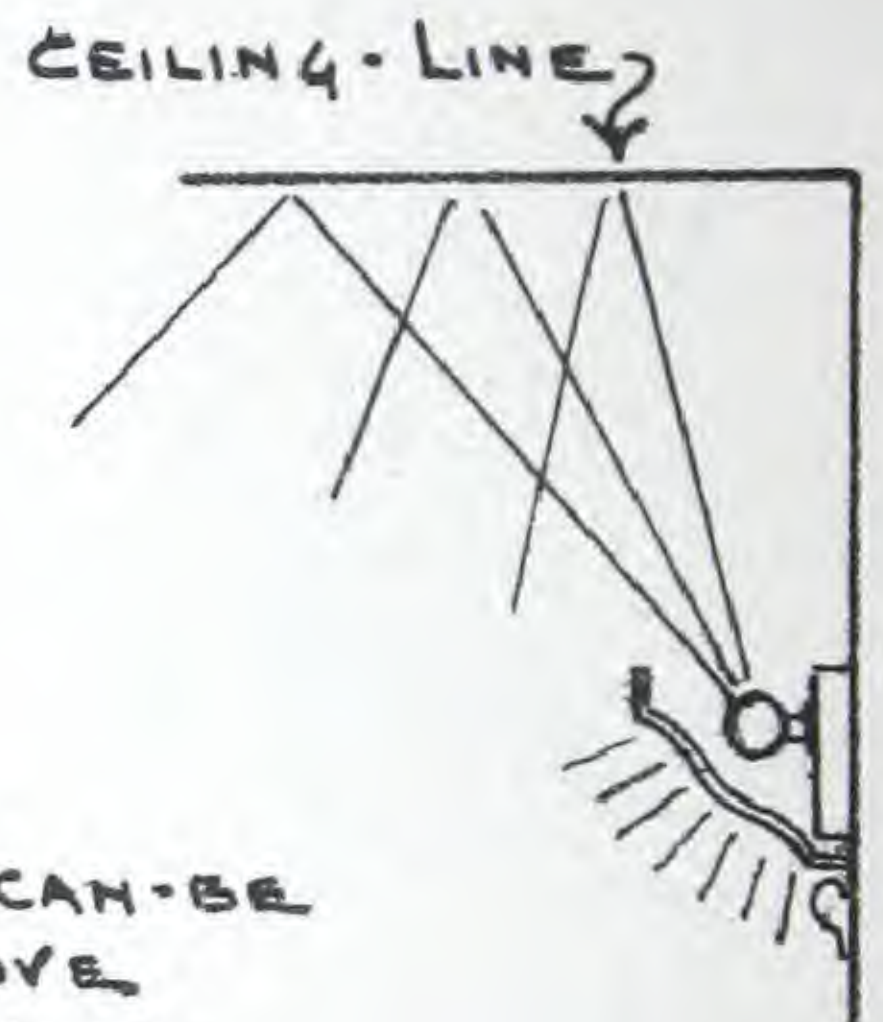
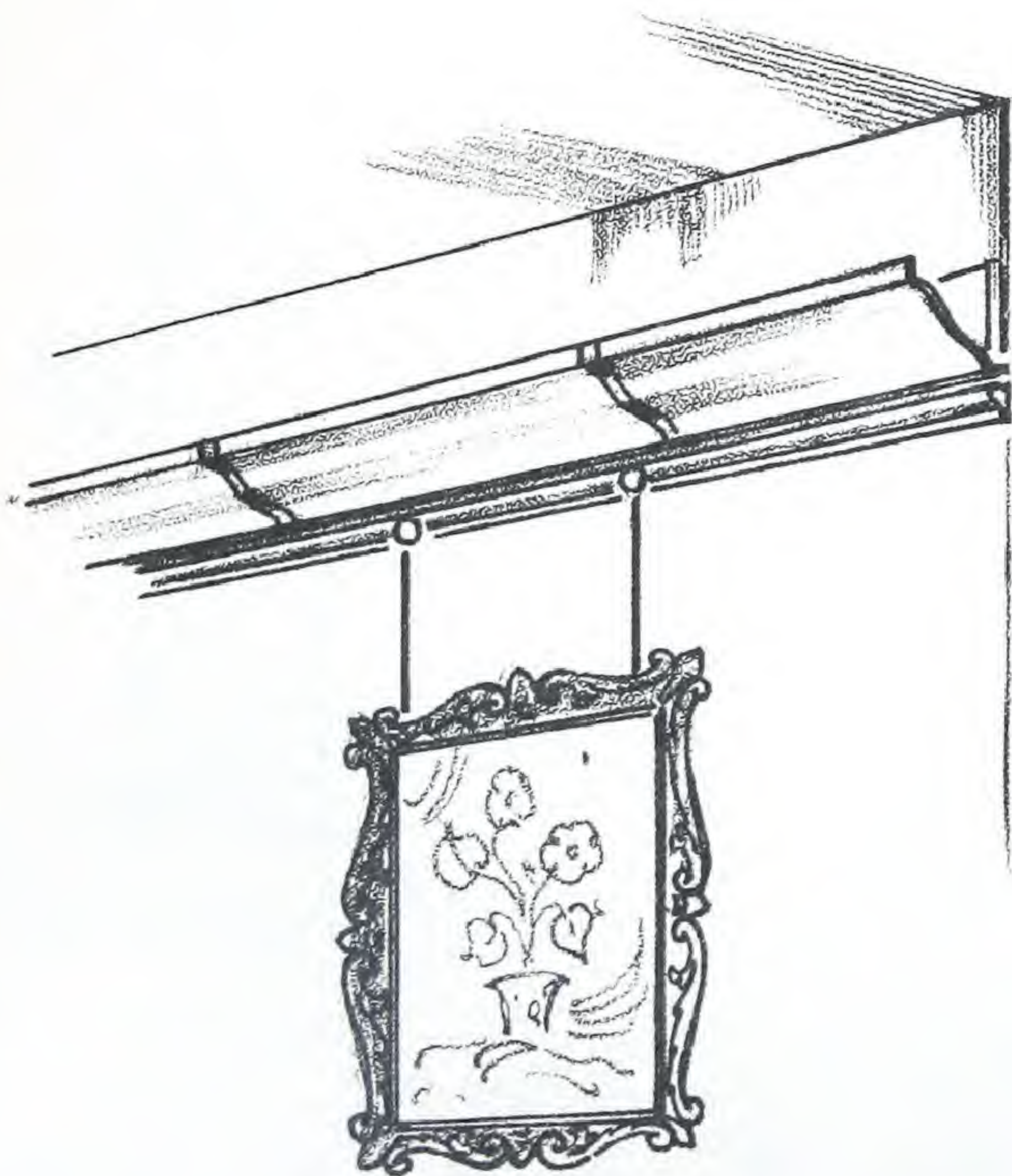
— HOME - LIGHTING - LIVING - ROOM —



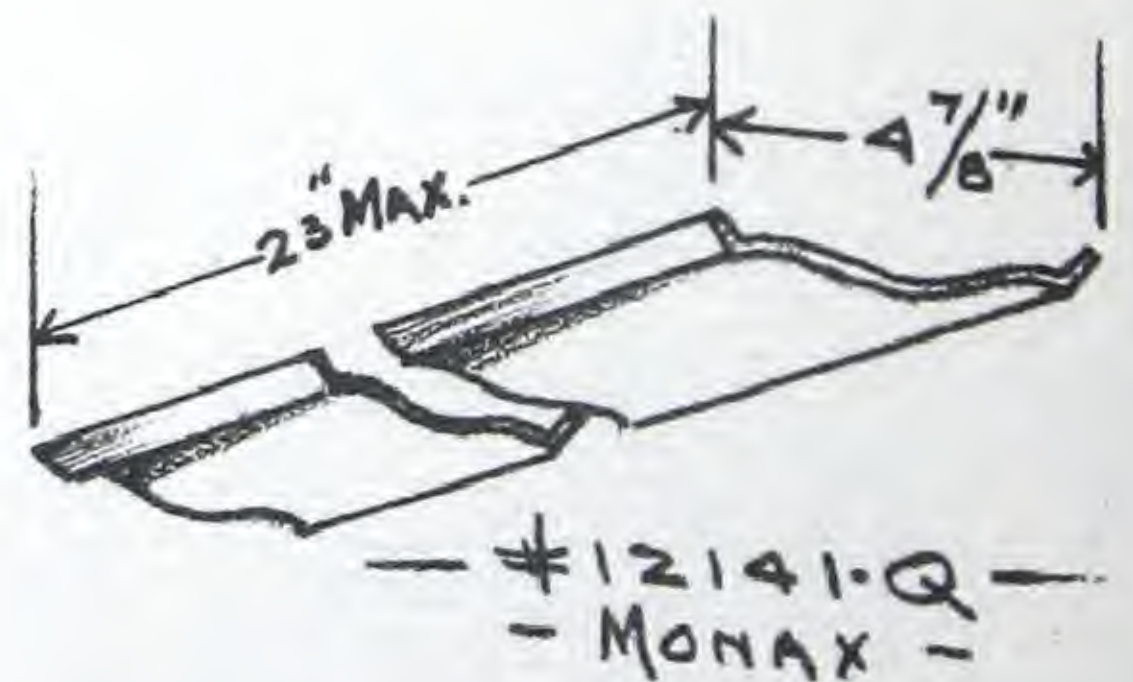
— 4-WAY —
— TROUGH - LIGHT —



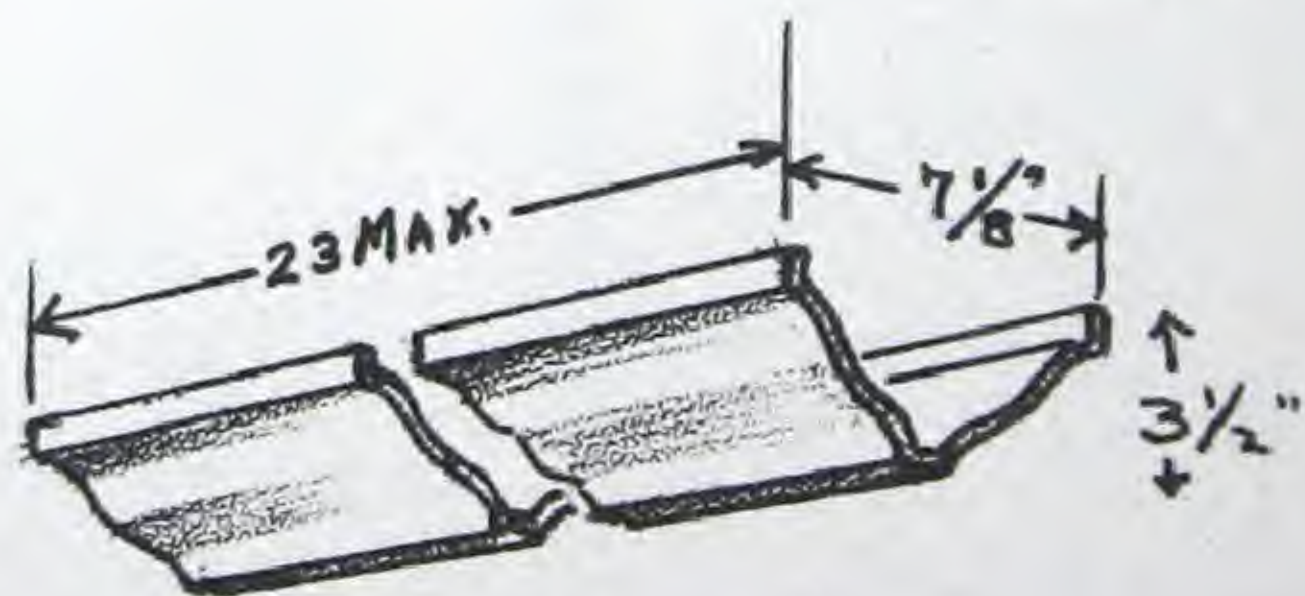
— SINGLE - TROUGH —
— SUSPENDED - FROM - CEILING —



#12141 Q - CAN - BE
USED - IN - COVE
LIGHTING - WITH
LUMILINE - LAMPS



— #12141 - Q —
— MONAX —



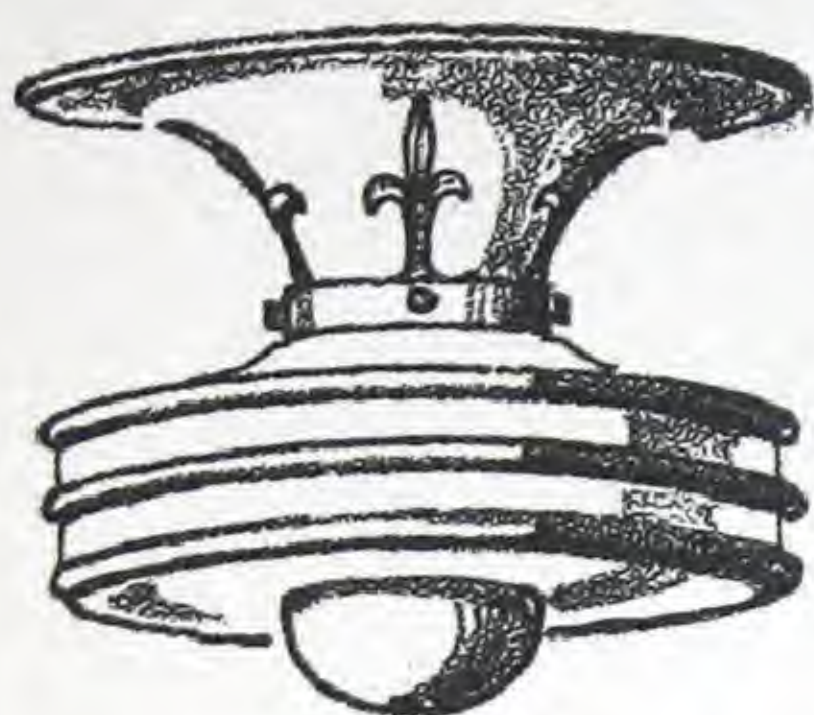
— #12141 - H —
— MONAX —

Dining Room

The center ceiling fixture is the most important unit of light in this room. This luminaire has two important functions to perform, first to illuminate the table, second to provide general illumination for the room. The lighting atmosphere of the dining room should be variable, dependent upon the particular tasks at hand; therefore the central luminaire should be adaptable for varying amounts of light. Glass should be used to diffuse the light and to protect the eyes. Several levels of illumination can be secured from Mazda three-light-lamps or by two or more individual lamps. A pair of small lamps on the buffet and shaded wall brackets are frequently desirable for their decorative value but are never adequate for general illumination.

— HOME LIGHTING — DINING ROOM —

— THE - SILVAX —



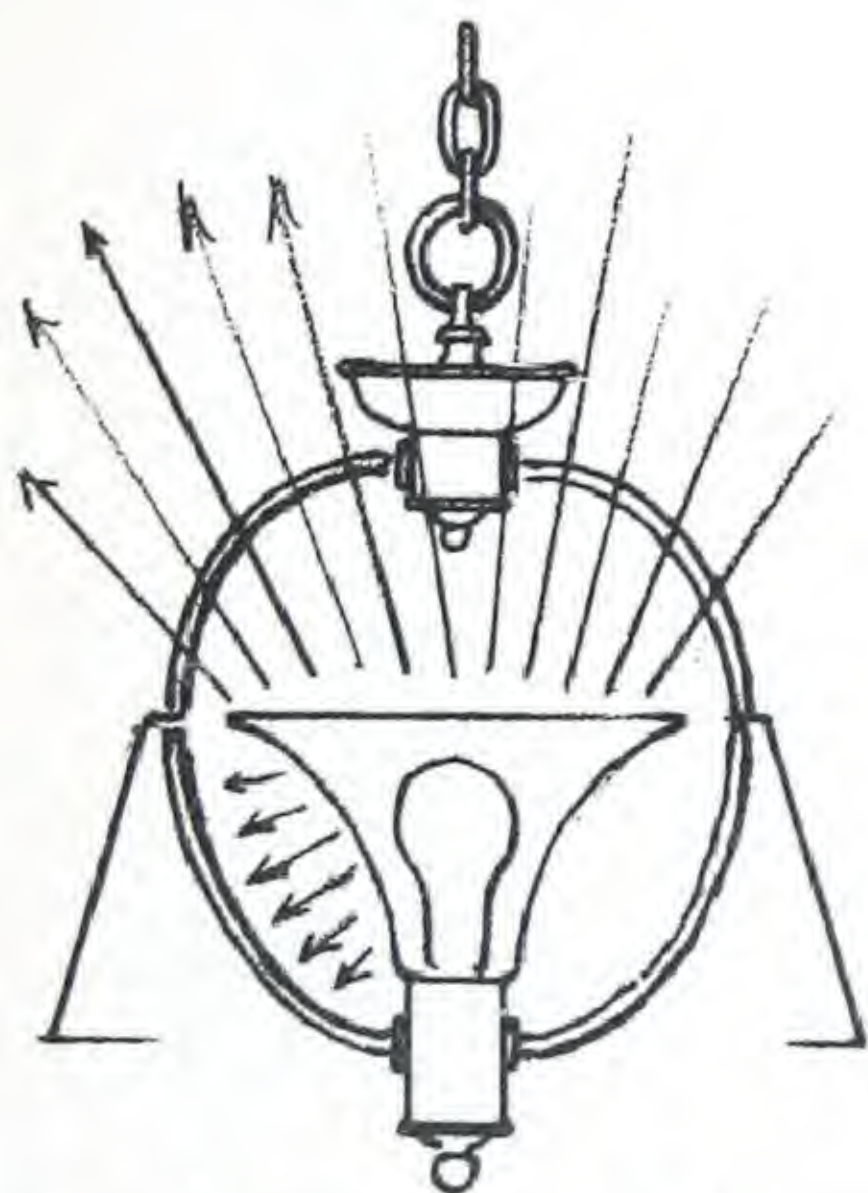
— CLOSE-UP - TYPE —
— FOR - LOW - CEILING —



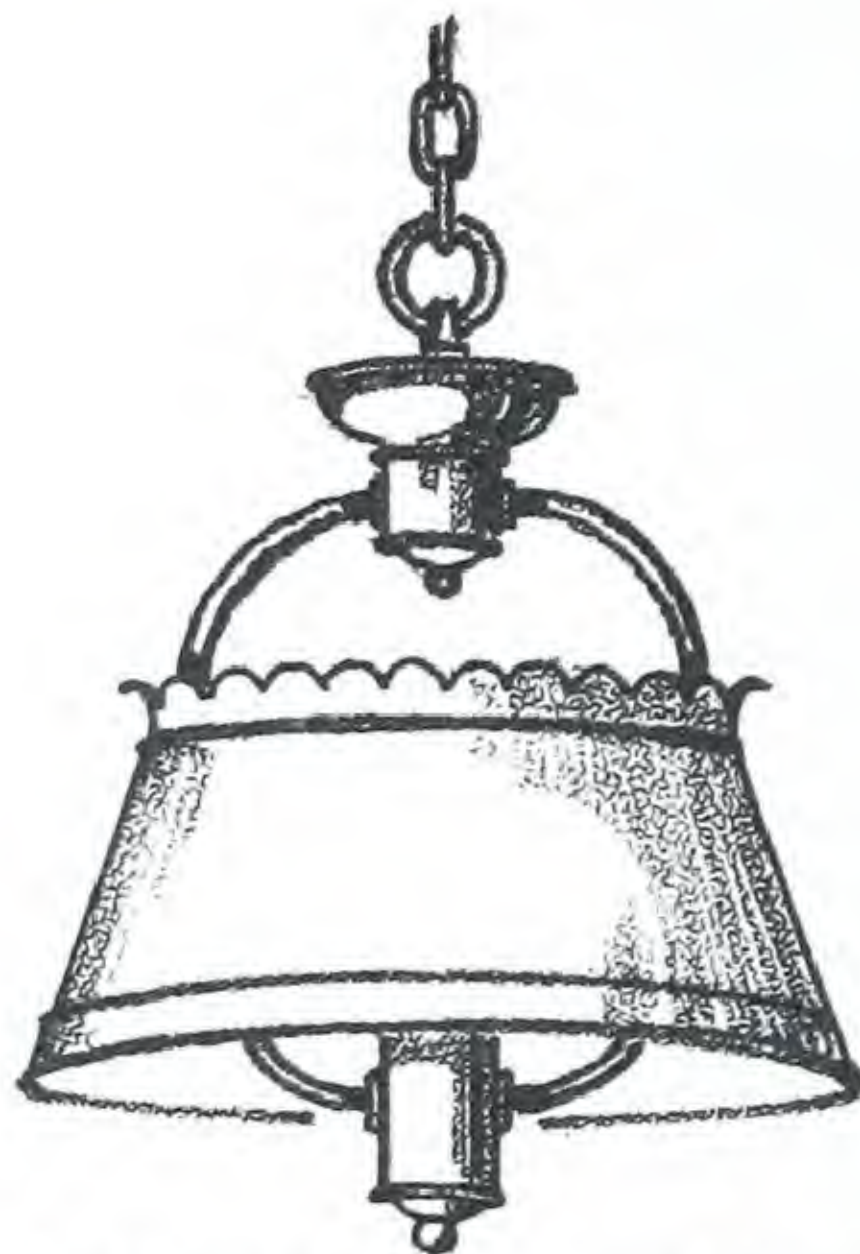
— MONAX - DECORATED - WITH —
— ALUMINUM - BANDS - & - CUP —
12031-D-160 - 10" DIA. 4" FITTER
12032-D-160 - 12" " 4" "
12033-D-160 - 14" " 6" "
12034-D-160 - 16" " 6" "
12035-D-160 - 18" " 6" "



— SUSPENDED - TYPE —
— FOR - HIGHER - CEILINGS —



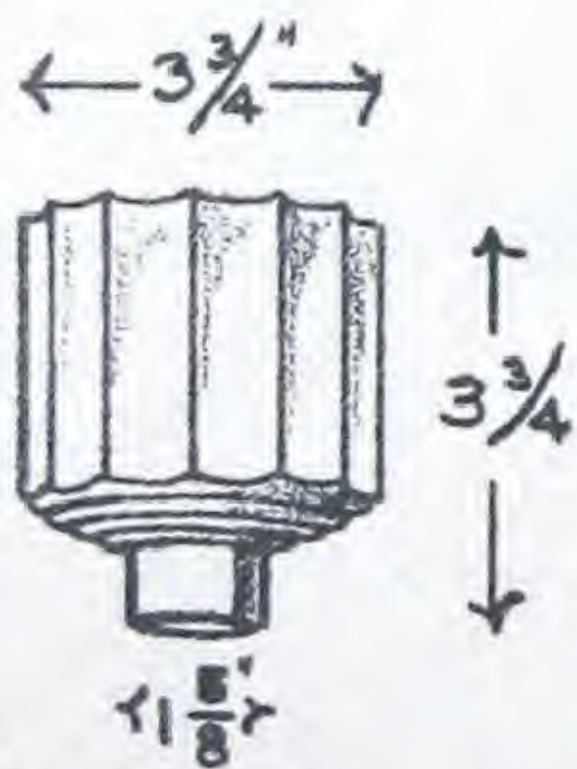
— CONSTRUCTION —
— DETAIL —



— AN - IDEAL - FIXTURE - TO —
— LIGHT - THE - DINING - ROOM —



5893
DENAX
11 1/4" DIA - 8" HIGH —
— DRILLED - 1 7/8" - HOLE —

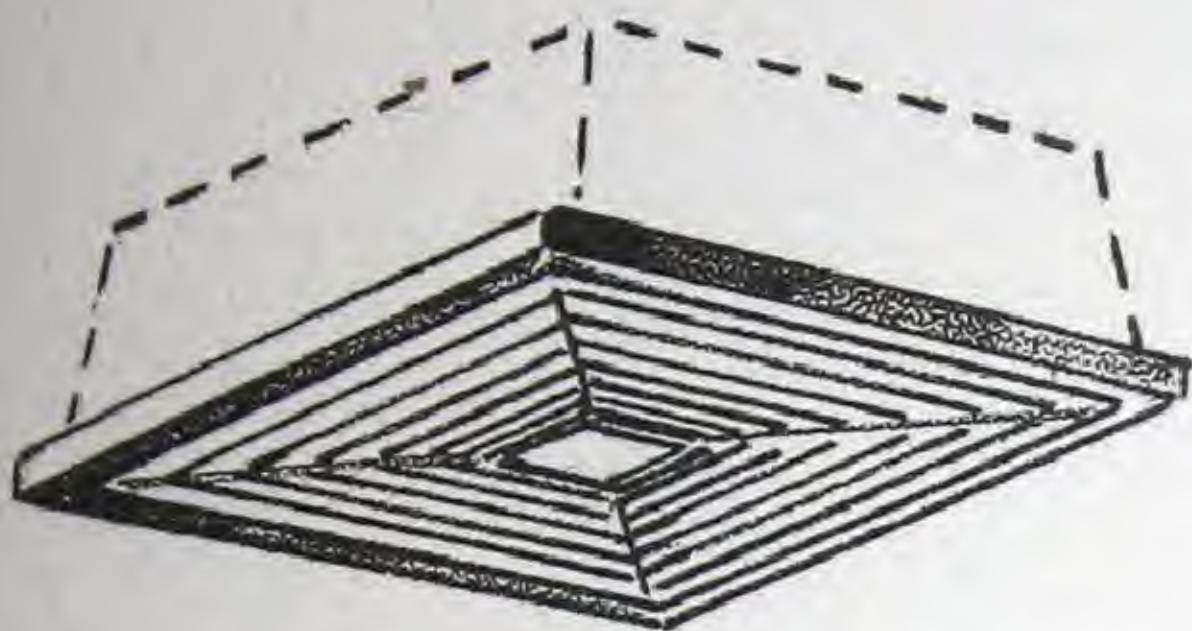


— # 12230 —
— MONAX - OR - IVORIAN —

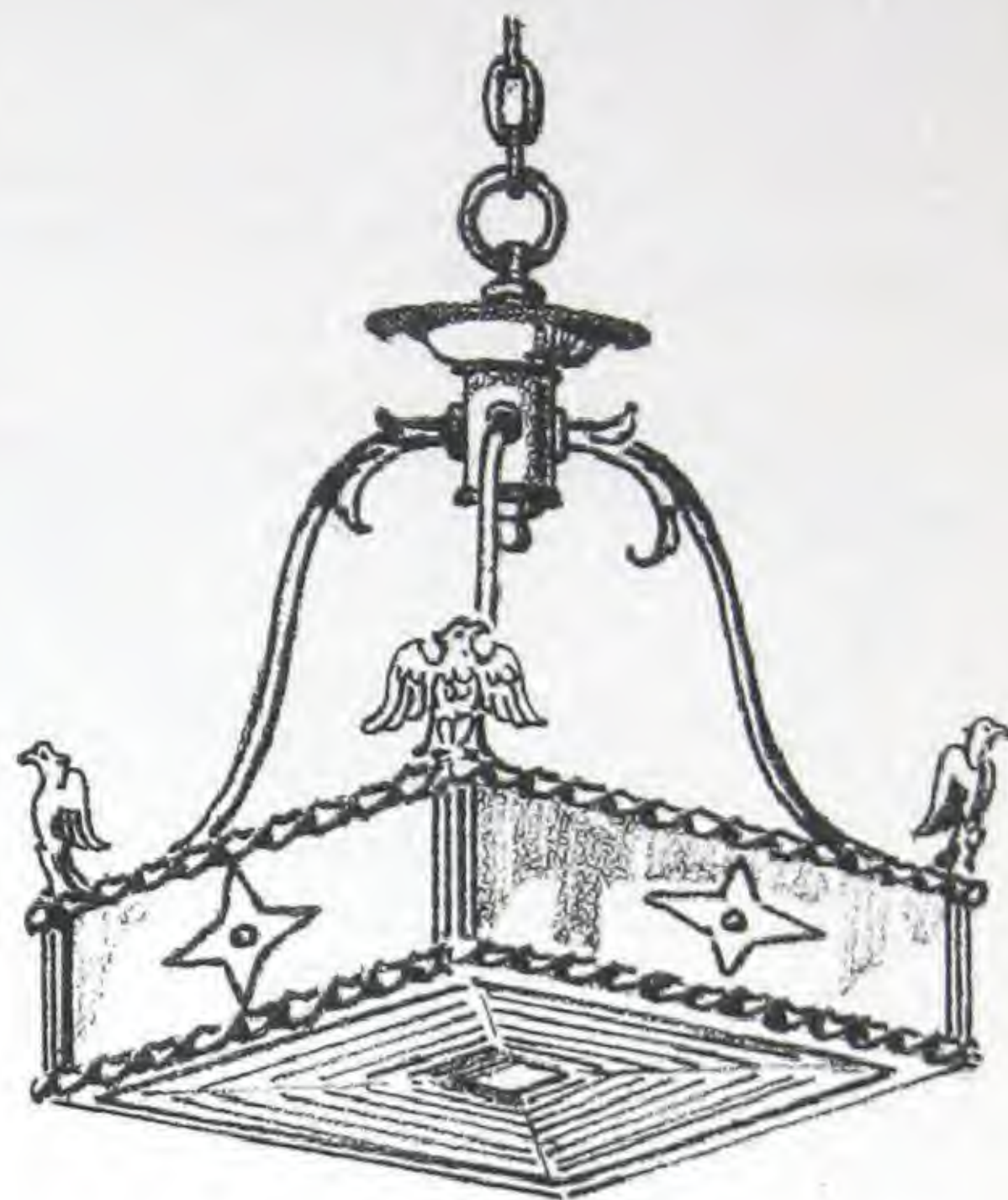


— # 12359 —
— IVORIAN - GLASS —
— DRILLED - 1/2" - CENTER —

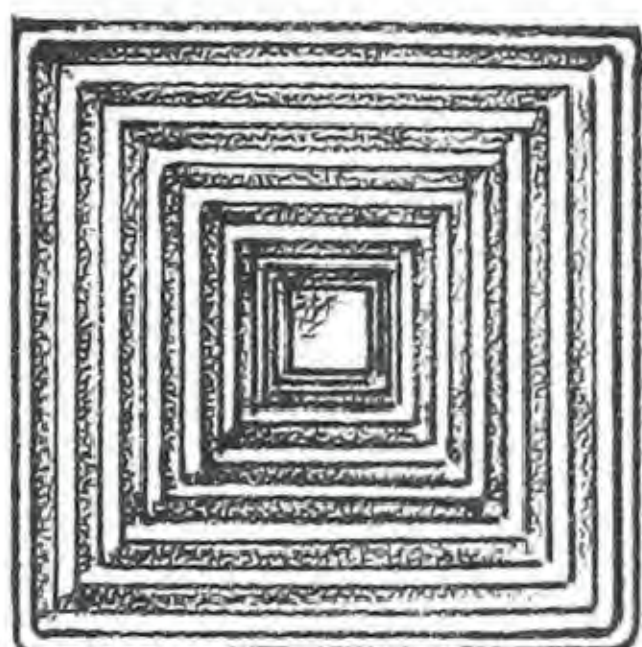
— HOME-LIGHTING — DINING-ROOM. —



— FLUSH-CEILING-LIGHT —
— WITH-RECESSED-BOX —



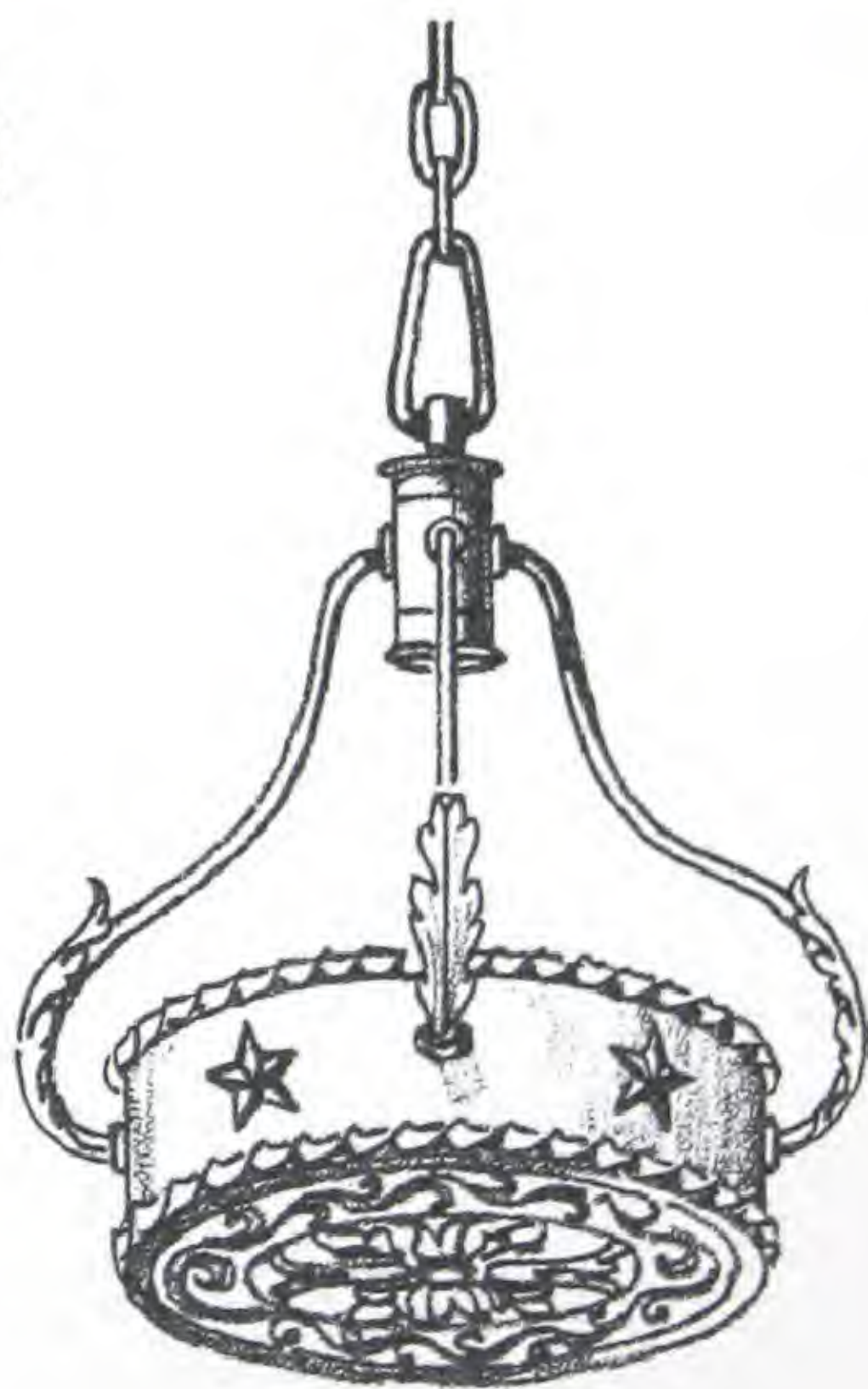
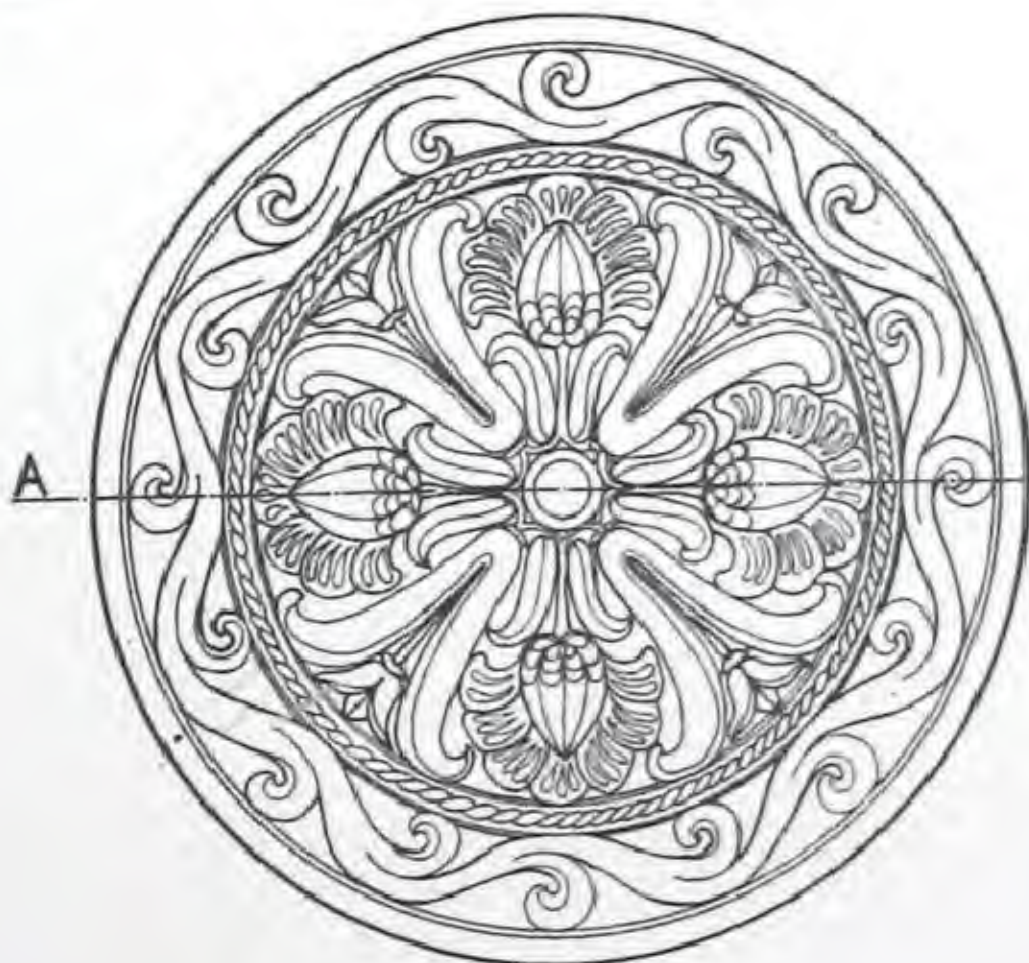
— SUSPENDED-TYPE —



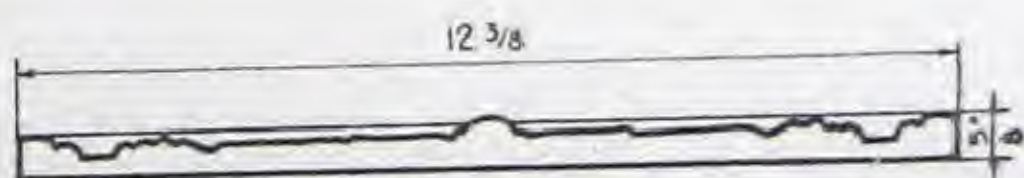
ILLUMINATING PLATES
#12109 - 6½" SQ - ¼" THICK
#12117 - 8" SQ - ¼" THICK
#12120 - 12" SQ - ¼" THICK
— ALYAX-GLASS —
— OR-LUMITE —
— GLASS —



— CLOSE-UP-FOR —
— LOW-CEILINGS —



— SUSPENDED TYPE —

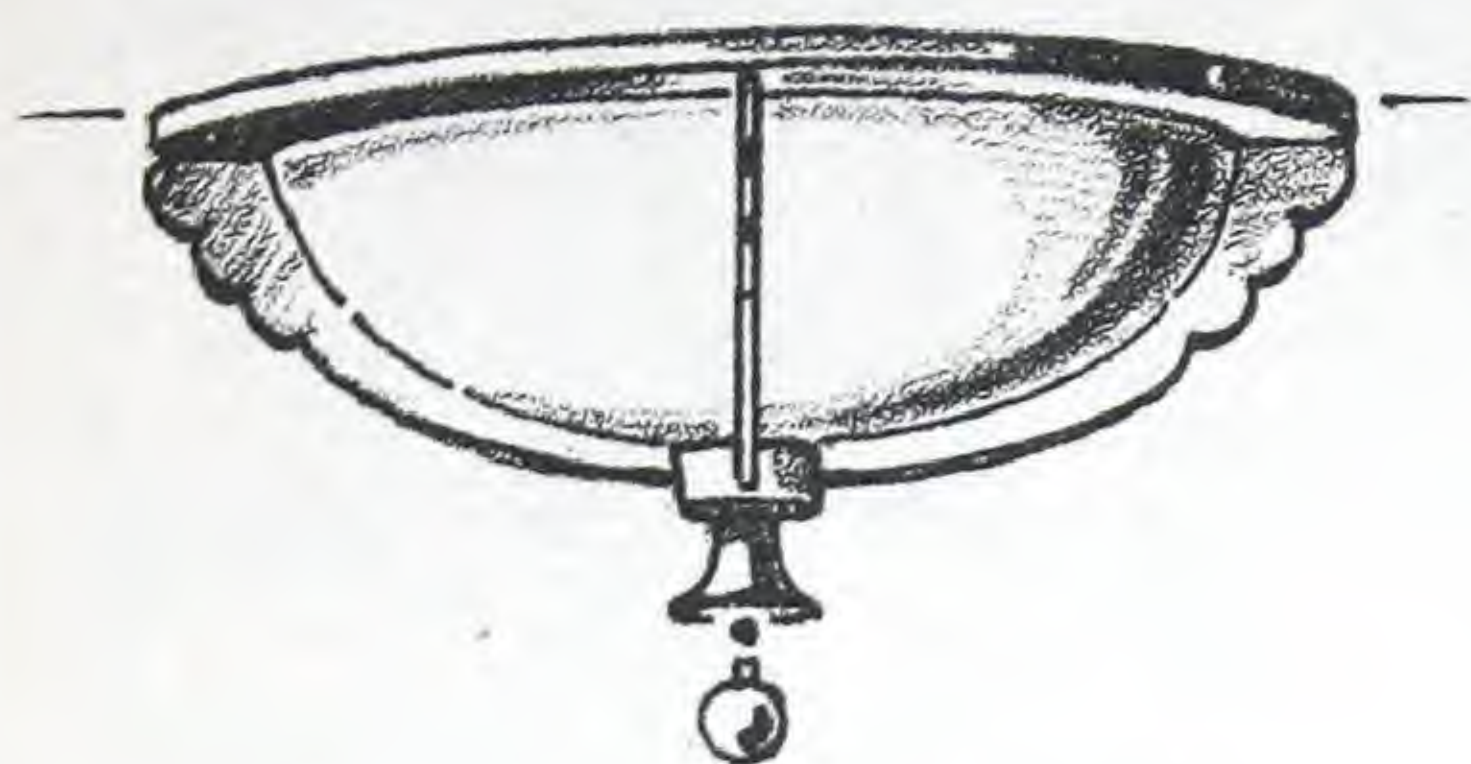


SECTION ON A

— # 2018 —
— CLEAR-OR-FROSTED —

— CORNING-GLASS-WORKS —

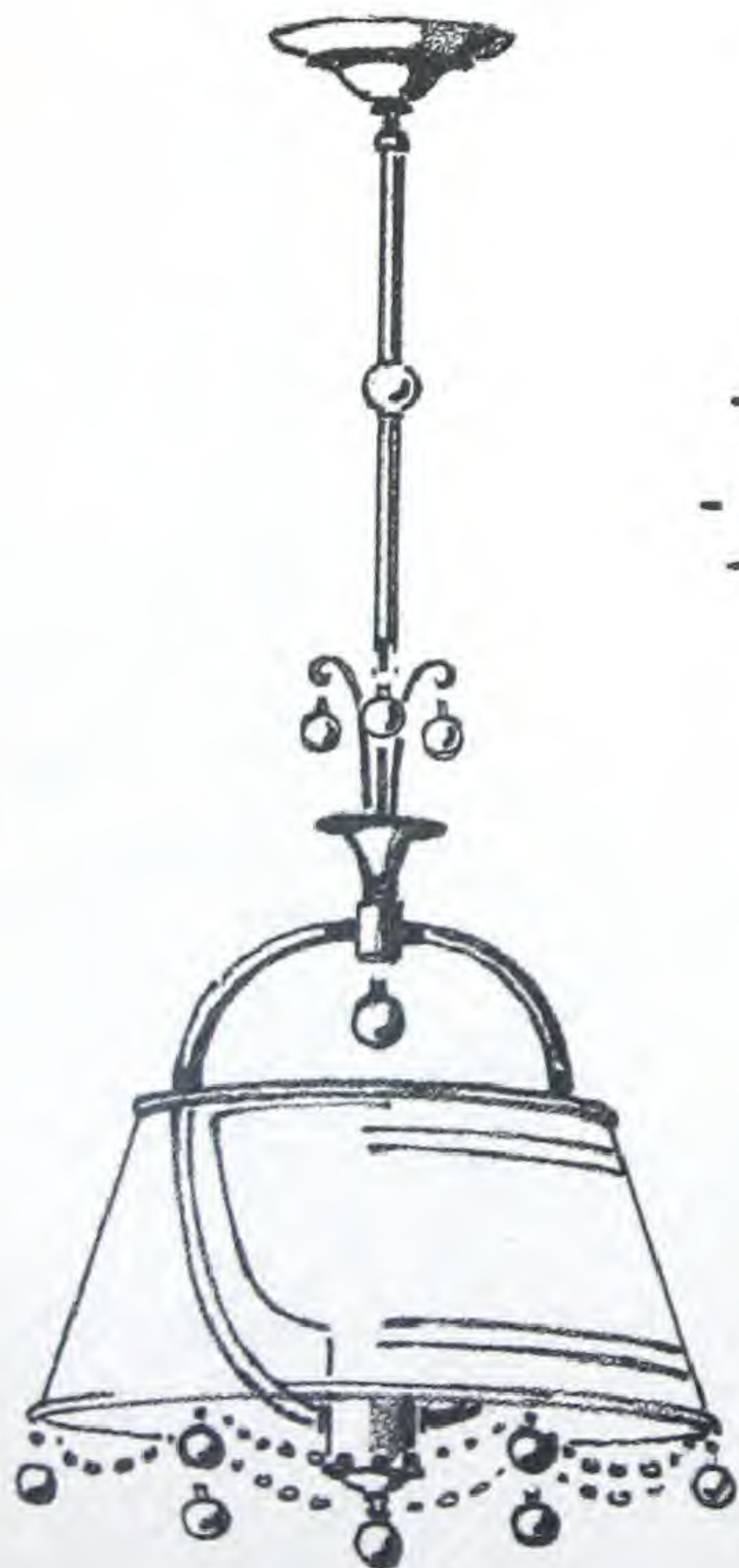
— HOME LIGHTING — DINING ROOM —



— FOR — LOW — CEILINGS —



— FOR — HIGH — CEILINGS —



- # 12214 -
- MONAX -
- DIA. $9\frac{3}{8}$ - DEPTH $6\frac{3}{8}$ -
- $2\frac{5}{8}$ " HEEL - FITTER -



- PLAIN — ROUND — MONAX — BOWL —
- # 9007 — 8" DIA. — $3\frac{1}{8}$ " DEEP —
- # 4999 — 10" DIA. — $3\frac{1}{8}$ " DEEP —
- # 5012 — 12" DIA. — $3\frac{3}{4}$ " DEEP —
- # 5013 — $14\frac{1}{4}$ " DIA. — $4\frac{7}{16}$ " DEEP —
- # 5014 — 16" DIA. — 5" DEEP —
- DRILLED - $\frac{1}{2}$ " BOTTOM - HOLE -

Kitchen

The kitchen requires well diffused illumination. A semi-indirect luminaire, preferably of enclosed type, may be used in the center of the ceiling. Local lighting is desirable for the sink, range and other working areas. The kitchen is the laboratory of the home and, therefore, requires an adequate quantity and excellent quality of light. White diffusing glass is most desirable for lighting the working areas in the kitchen, as it does not create annoying high lights. Glass is easily cleaned - use it in the kitchen!

— HOME. LIGHTING — KITCHEN —



— CHAIN - SUSPENSION —
— FOR - HIGH - CEILING —

— "THE - PILGRIM" —
— MONAX —



- # 12300 - 8 7/16" DIA - 4" FITTER —
- # 12301 - 9 7/16" DIA - 4" " —
- # 12302 - 10 7/16" DIA - 4" " —
- # 12304 - 12" DIA. 6" " —
- # 12304A - 12" DIA. 4" " —

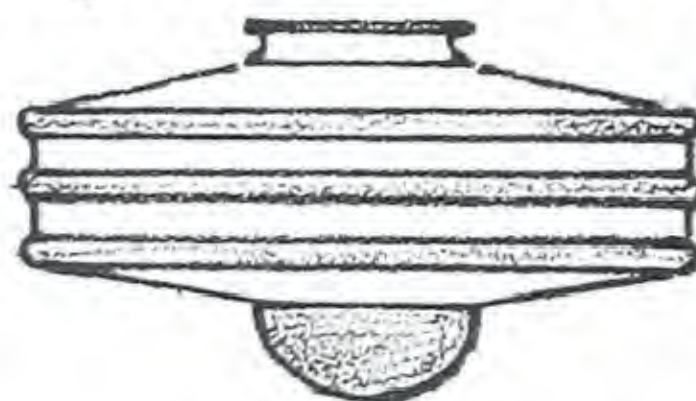


— CLOSE - UP - TYPE —



— CLOSE - UP - TYPE —

— "THE - SILVAX" —
— MONAX - GLASS - ALUMINUM - BANDS & CUP —

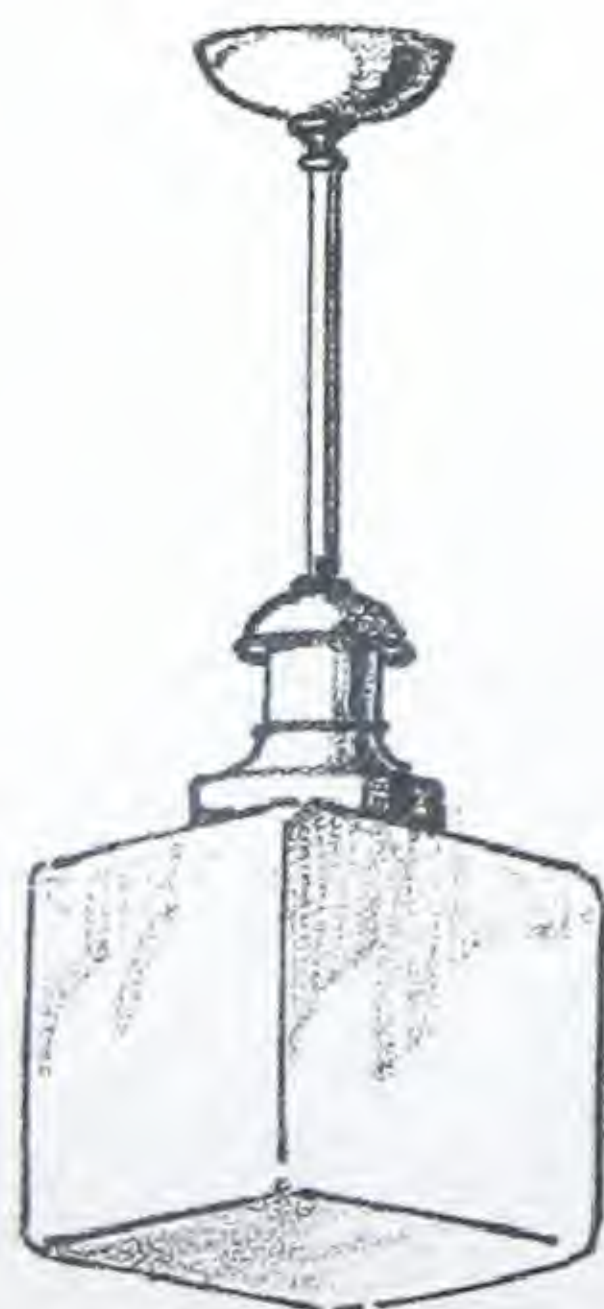


- # 12031 - D160 —
- 10" DIA. 5 1/2" DEEP —
- 4" FITTER —

- # 12032 - D160 —
- 12" DIA. 5 1/2" DEEP —
- 4" FITTER —



— CHAIN —
— SUSPENSION —



— ROD —
— SUSPENSION —

— "THE - CUBE" —
— MONAX —



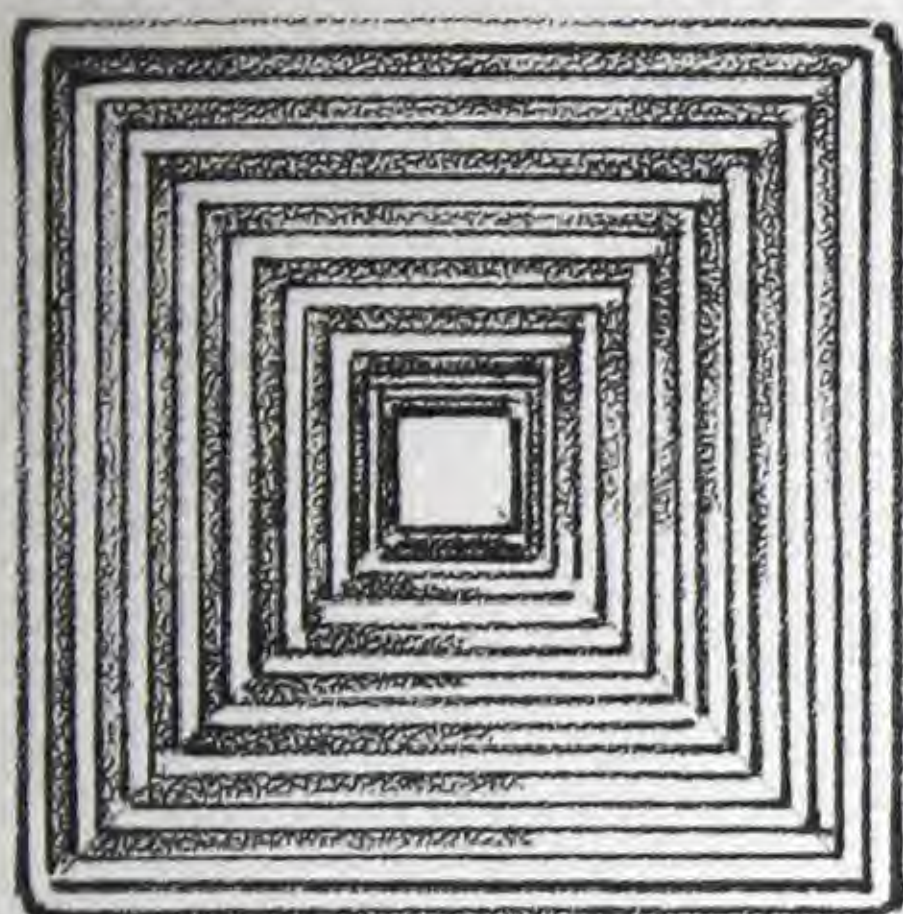
- 12087 - 4 3/8" SQ. 3 1/4" FITTER —
- 2347 - 6" SQ. 3 1/4" " —
- 12089 - 7" SQ. 4" " —
- 12088 - 8" SQ. 4" " —



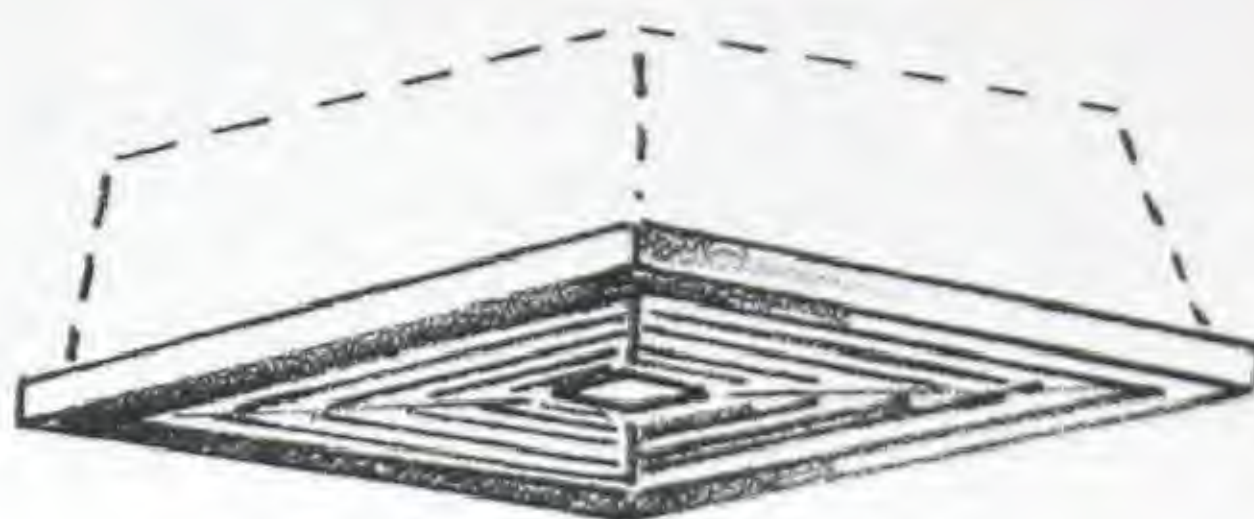
— CLOSE —
— UP —

— HOME LIGHTING - KITCHEN —

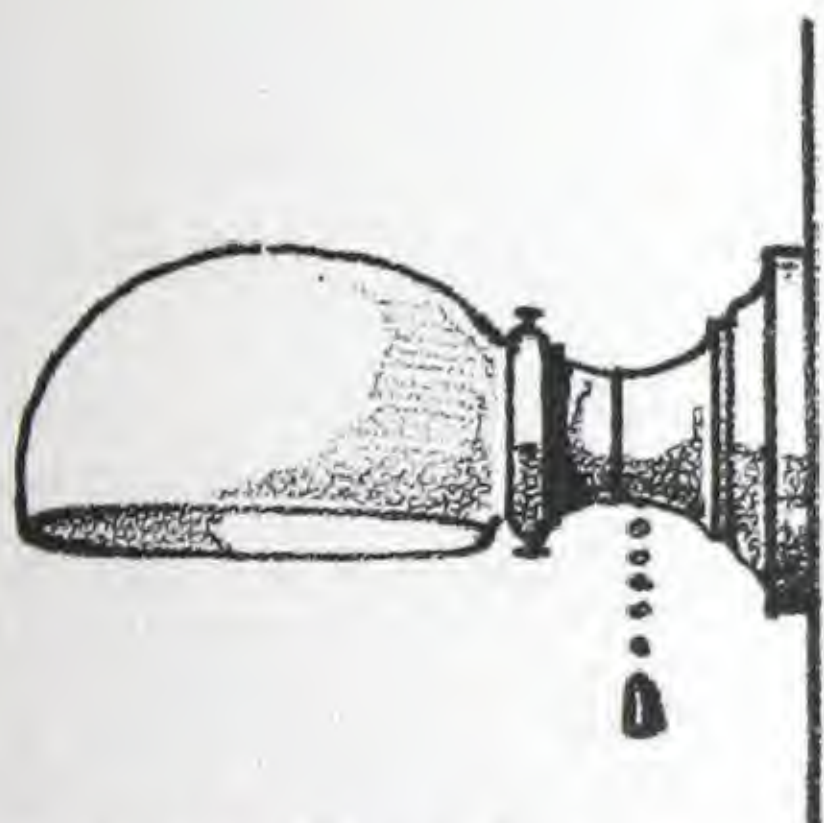
— ILLUMINATING - PLATE —
 — ALVAX GLASS —
 — OR - LUMITE - GLASS —



#12109 - 6 1/2" SQ 1/4" THICK
 #12117 - 8" SQ 1/4" THICK
 #12120 - 12" SQ 1/4" THICK



— FLUSH - TYPE - WITH —
 — BUILT - IN - BOX —



— WHERE - IT - IS - DESIRABLE —
 — TO - PROJECT - THE - LIGHT —
 — DOWNWARD - #4221 - WILL —
 — BE - FOUND - SATISFACTORY —



← 6" →
 — 2 1/4" FITTER —
 — #4221 MONAX —
 — HALF SHADE —

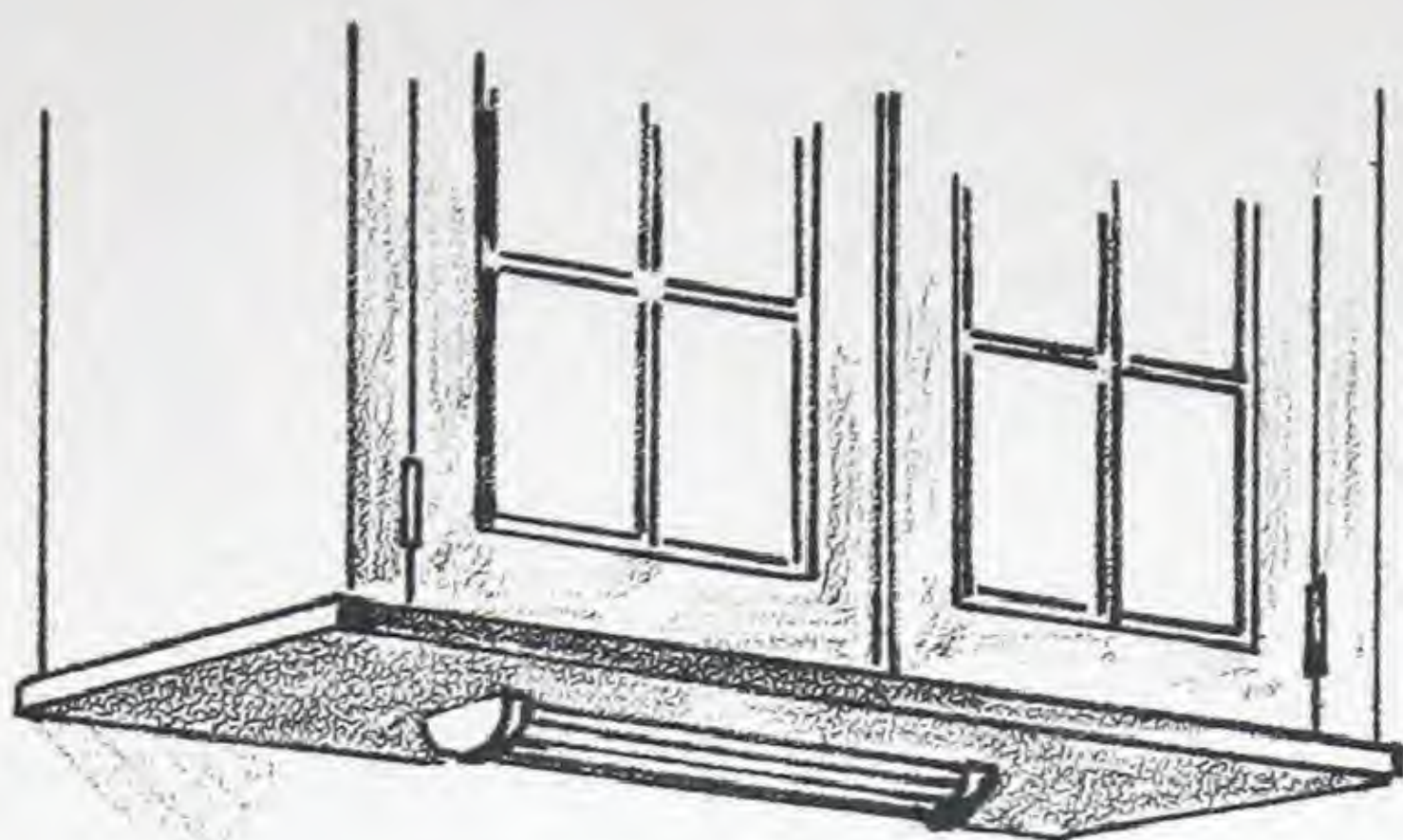


— MONAX - ROUND - BOWLS —



— #12192 - 8" DIA. - 3" DEEP -
 — #12146 - 10" DIA. - 3 1/2" DEEP -
 — #1214T - 12" DIA. - 4" DEEP -
 — DRILLED - 1/2" - BOTTOM - HOLE —

— HOME LIGHTING — KITCHEN —



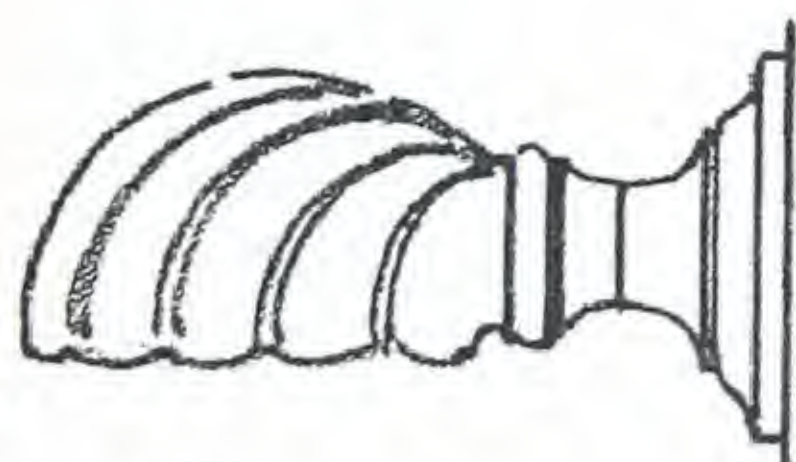
- SOME TIMES IT IS DESIRABLE —
- TO PLACE A LIGHT BENEATH —
- A CABINET —
- #12320 LUMILINE WILL BE —
- FOUND EXCELLENT FOR THIS —
- PURPOSE —



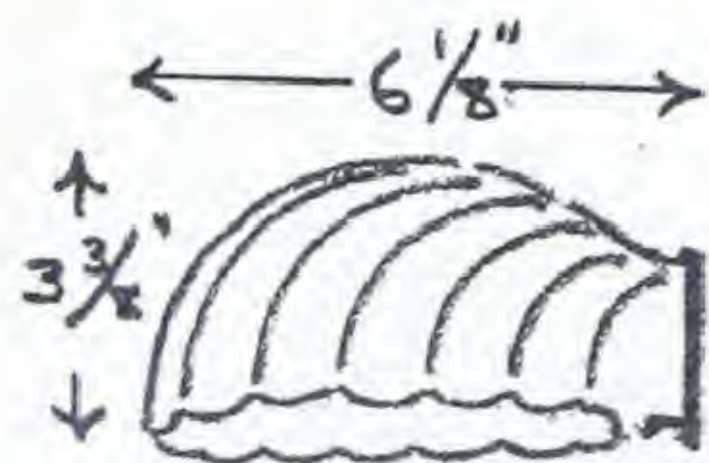
- #12320 —
- MONAX —
- 2 7/8" WIDE —
- 12 7/8" LONG —
- 17 7/8" LONG —
- 1 1/2" DEEP —



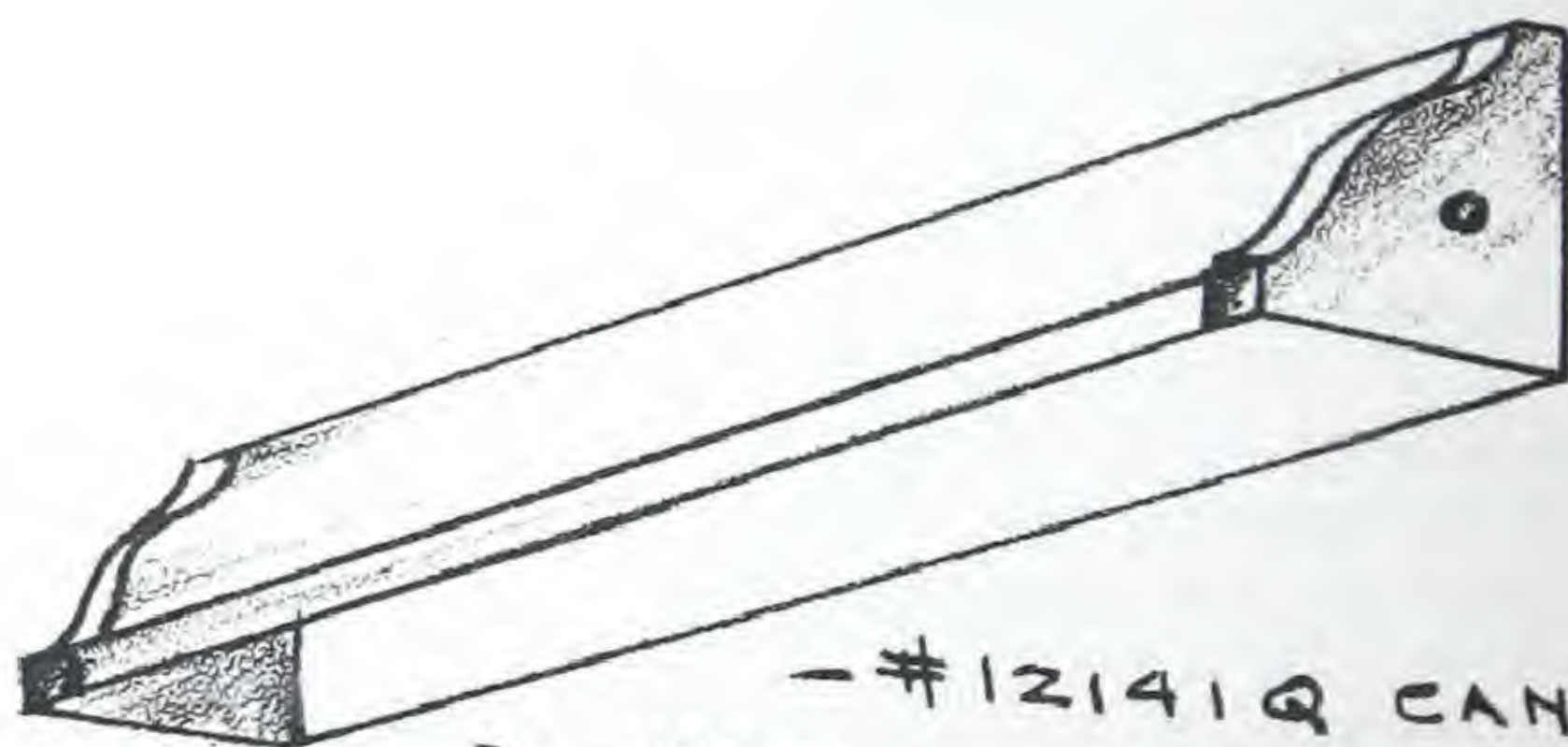
- WALL BRACKET —



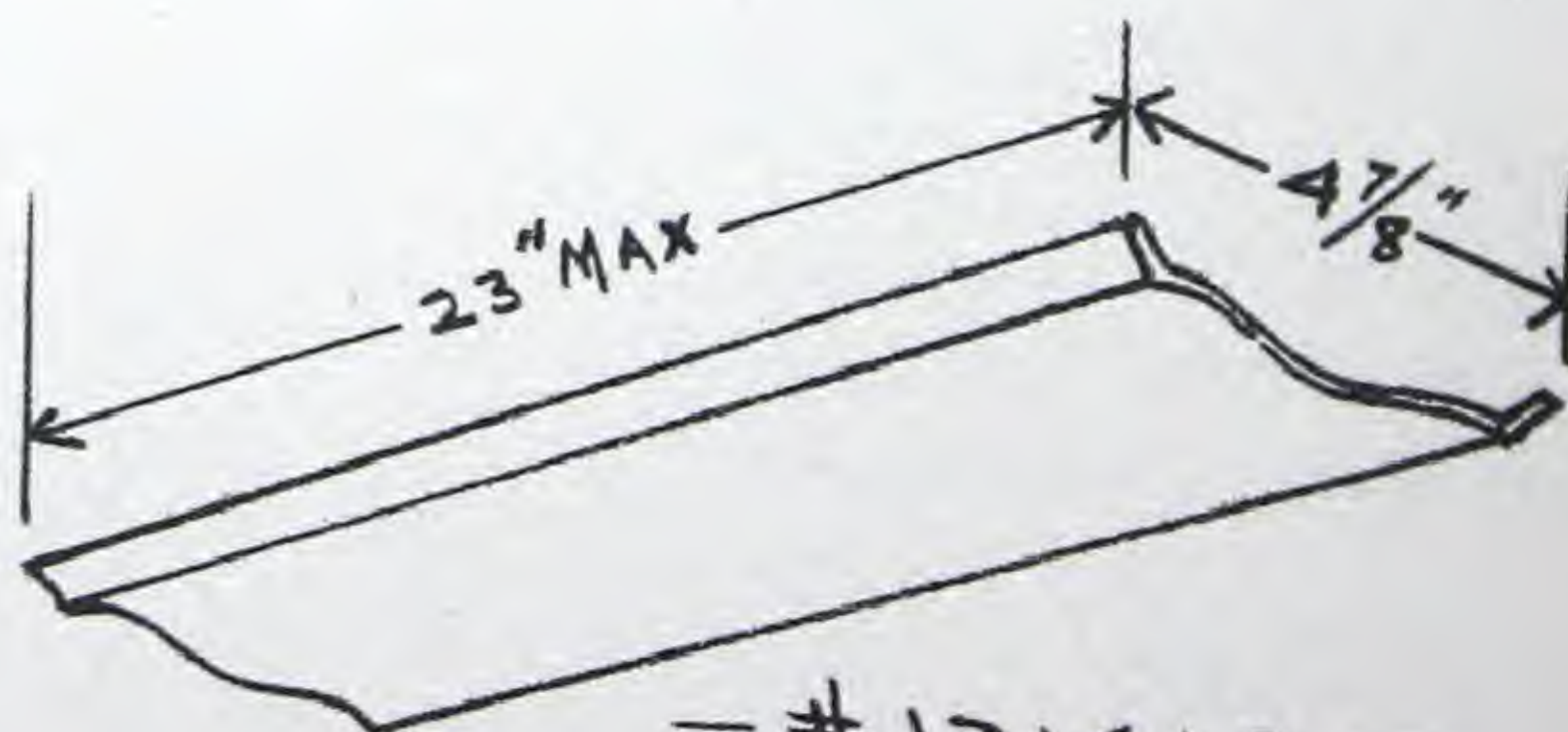
- WALL BRACKET —
- FOR OVER SINK —



- #5393 IVORIAN —
- SHELL-SHAPED HALF SHADE —
- 2 1/4" FITTER —



- #12141Q CAN —
- BE USED IN A BRACKET —
- OVER STOVE OR WORK TABLE —

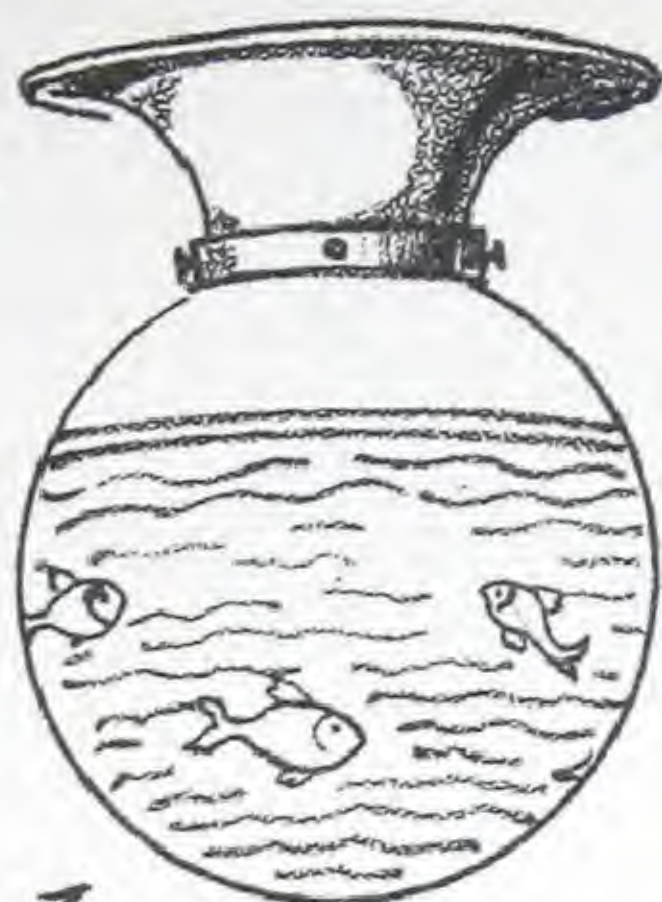


- #12141Q —
- MONAX —

Bathroom

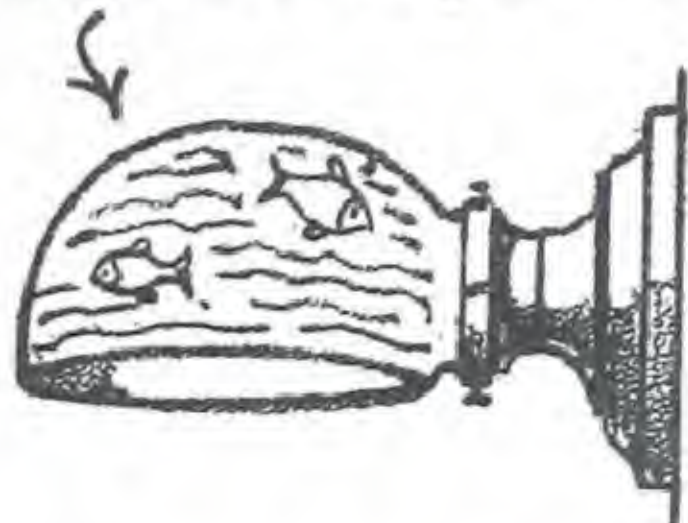
If the room is large, it is suggested that a MONAX glass enclosing globe of an appropriate design be used as a ceiling fixture in addition to lights at the mirror and over the tub which are generally sufficient for small rooms. Mirror lighting must be designed to provide adequate facial illumination. The light over the tub or shower stall is suggested as an additional safety element. This unit should be vapor proof.

— HOME-LIGHTING — BATH —

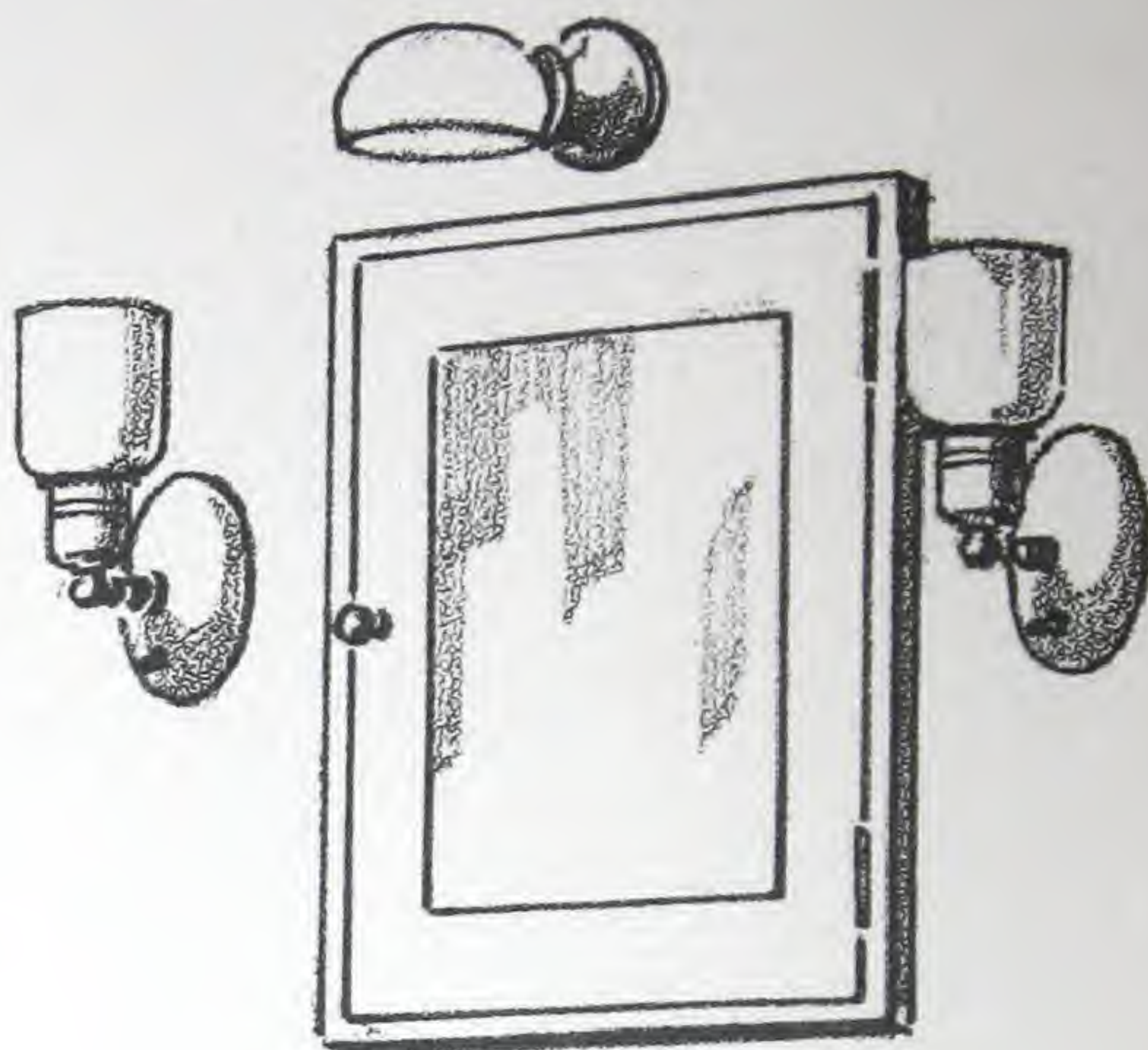


— # 832 E 50 - 8" BALL - GLOBE —

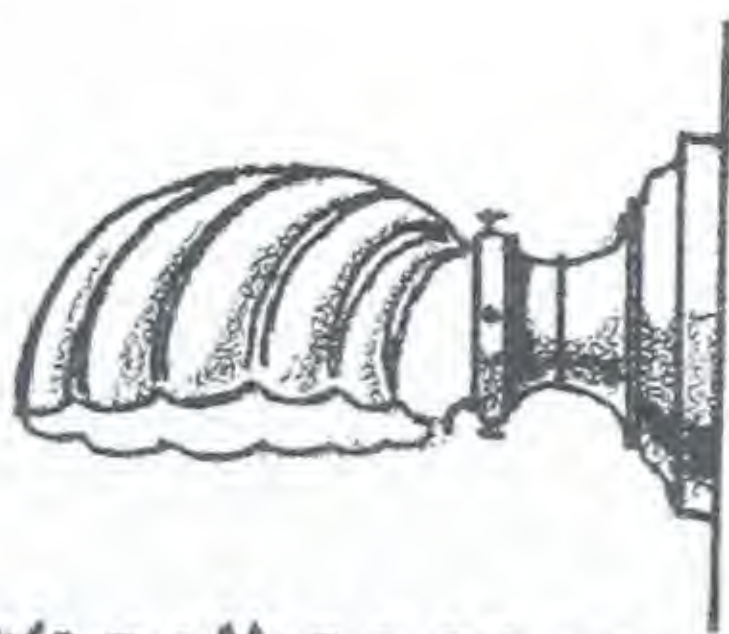
— # 4221 E 50 - HALF - SHADE —



— THE ABOVE TWO PIECES OF MONAX —
— GLASS ARE ETCHED AND TONED —
— IN DELICATE SHADES OF SEA —
— GREEN. THEY MAKE A FINE —
— COMBINATIONS FOR BATH ROOMS —



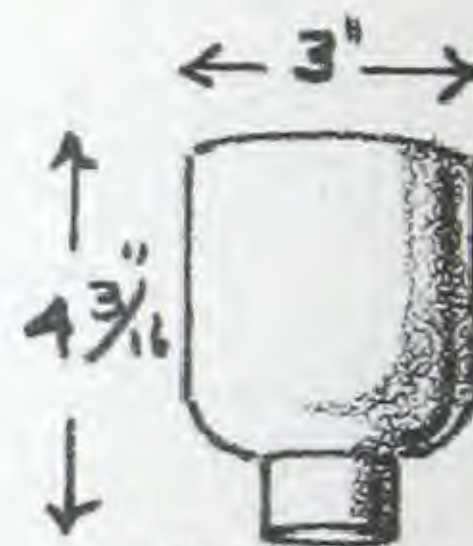
— A HALF - SHADE OVER OR —
— BRACKETS ON EACH SIDE —
— OF THE MEDICINE CABINET —
— WILL PROVIDE AMPLE LIGHT —



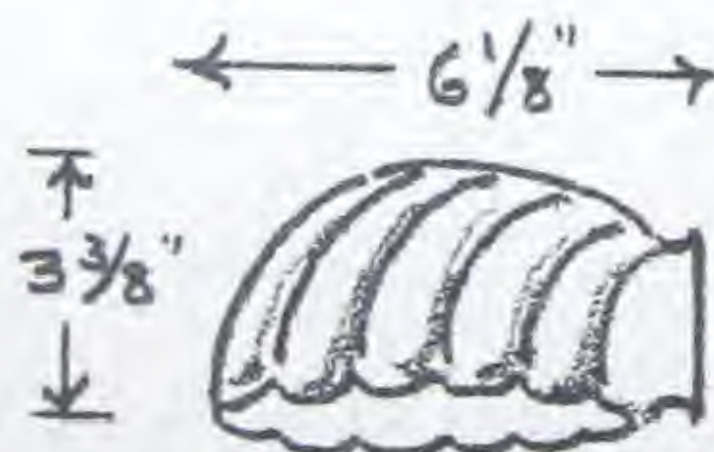
— OVER MIRROR —
— BRACKET —



4221 MONAX
— 6" LONG —
— 3 1/4" HIGH —
— 2 1/4" FITTER —



— 1 5/8" FITTER —
— # 12326 —
— MONAX —
— OR IVORIAN —



— # 5393 —
— IVORIAN —



MONAX ROUND BALL GLOBE			
# 828	6" DIA.	3 1/4" FITTER	—
# 830	7" DIA.	3 1/2" "	—
# 832	8" DIA.	4" "	—
# 850	10" DIA.	4" "	—



— CEILING —
— TYPE —

— HOME LIGHTING—BATH—



2 1/4" FITTER

#4221-ESI

DECORATED AS 5881-ESI



— #5881-ESI —

— 9" DIA. - 6 3/4" DEEP - 4" FITTER —
 — NOUYELLE-ETCHED-ON-MONAX —
 — PASTEL-COLORS-HAVE-BEEN —
 — BLENDED-IN-HARMONIOUS —
 — COLORS-OVER-SURFACE-ETCHING —



— CEILING-TYPE —

"THE CUBE"



— CEILING-LIGHT —



— SQUARE-MONAX-GLOBE —
 — #12087 - 4 3/8" SQ-3 1/4" FITTER —
 — #2347 - 6" SQ-3 1/4" " —
 — #12089 - 7" SQ-4" " —
 — #12088 - 8" SQ-4" " —



— CEILING-LIGHT —



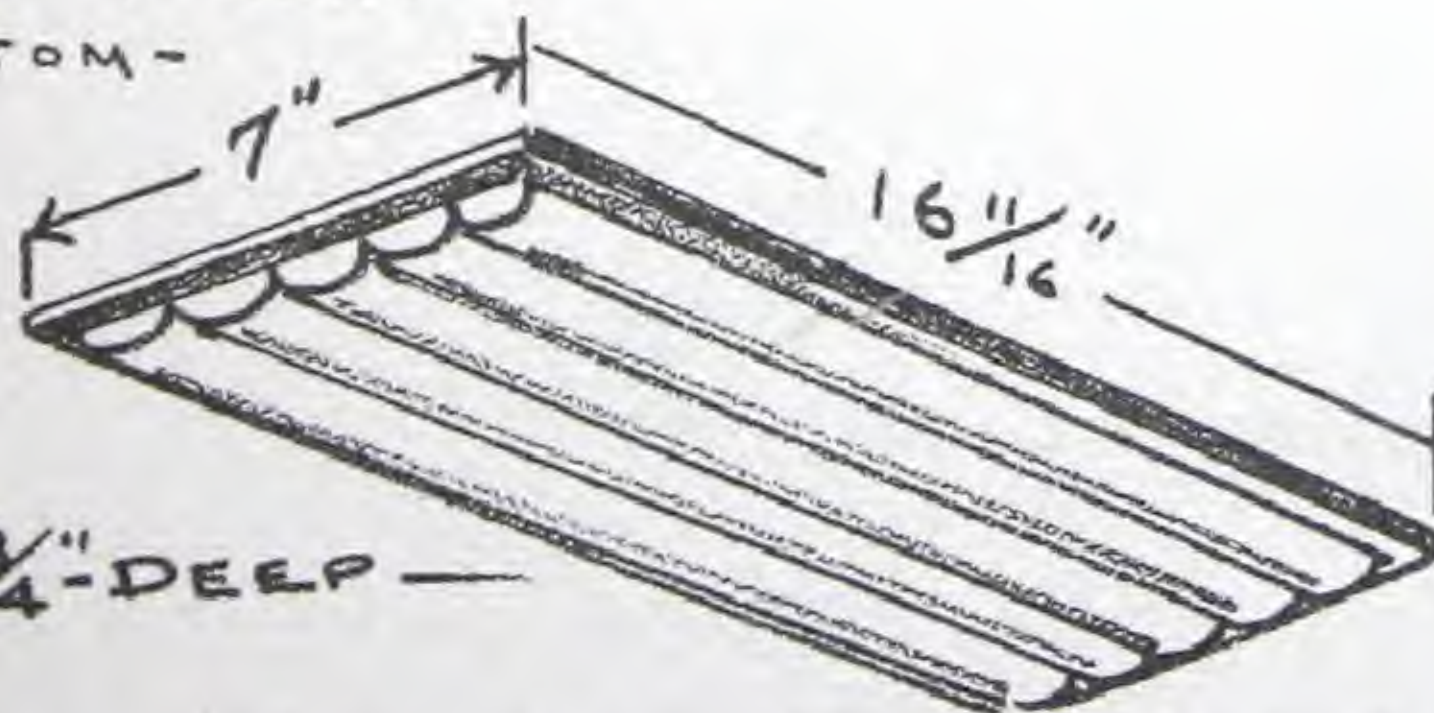
MONAX-OR IVORIAN ROUND BOWL —

#12192 - 8" DIA. - 3" DEEP —

#12146 - 10" DIA. - 3 1/2" DEEP —

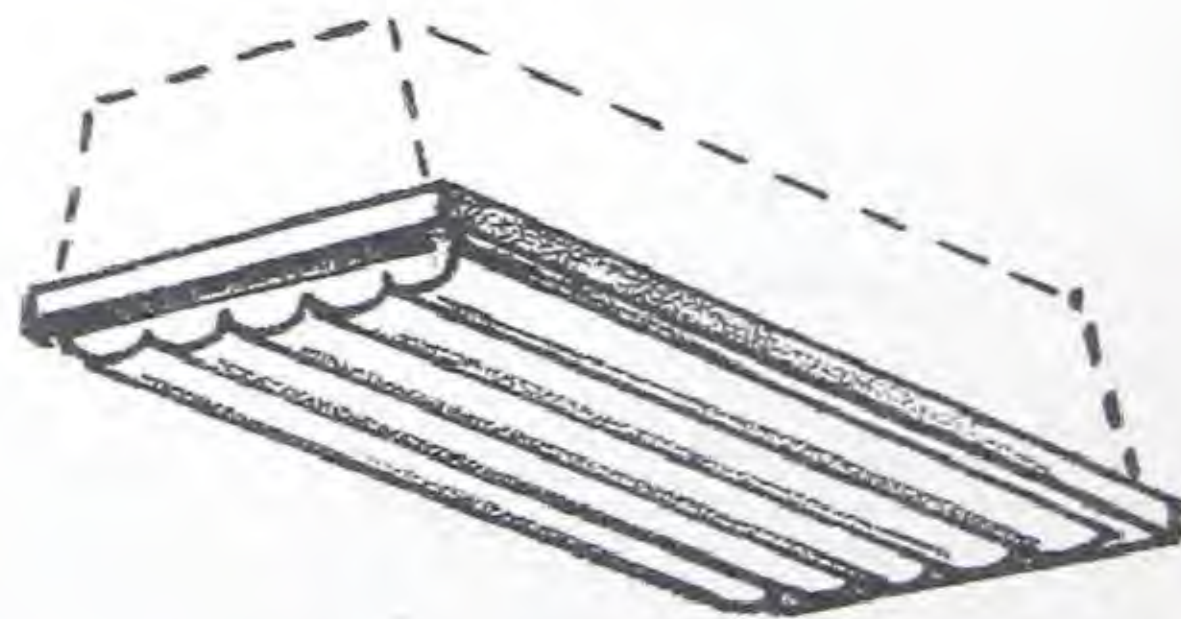
#12147 - 12" DIA. - 4" DEEP —

DRILLED 1/2" BOTTOM-HOLE —



— 3/4" DEEP —

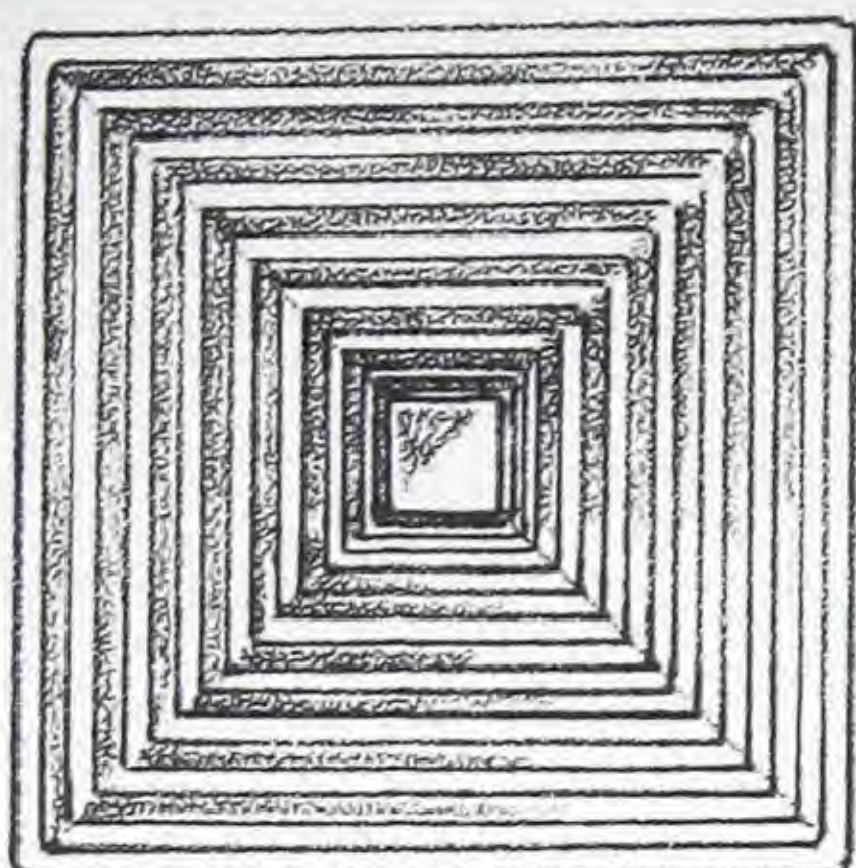
— #12128 - LUMITE-SATIN —
 — OR AMBERTONE —



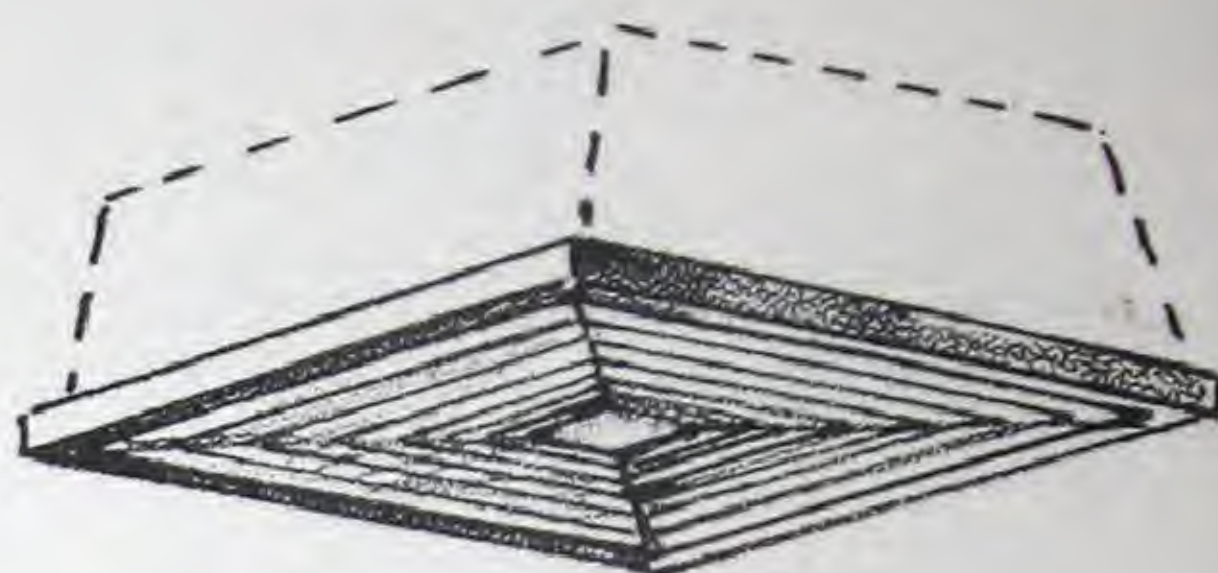
— FLUSH-CEILING-TYPE —
 — FOR-ABOVE-TUB-OR-IN- —
 — CENTER-OF-ROOM —

— CORNING-GLASS-WORKS —

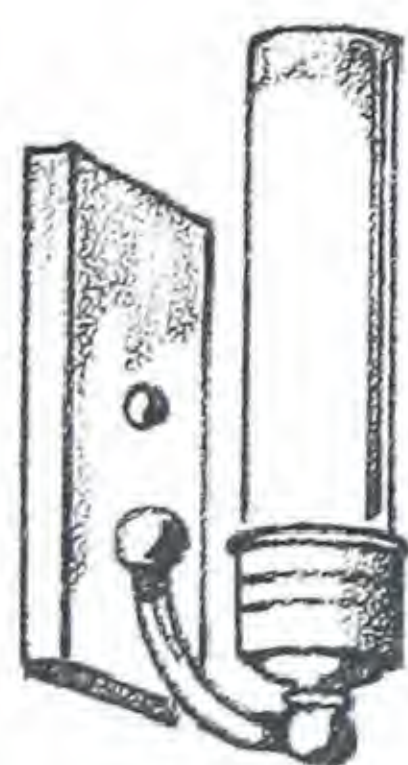
— HOME LIGHTING — BATH —



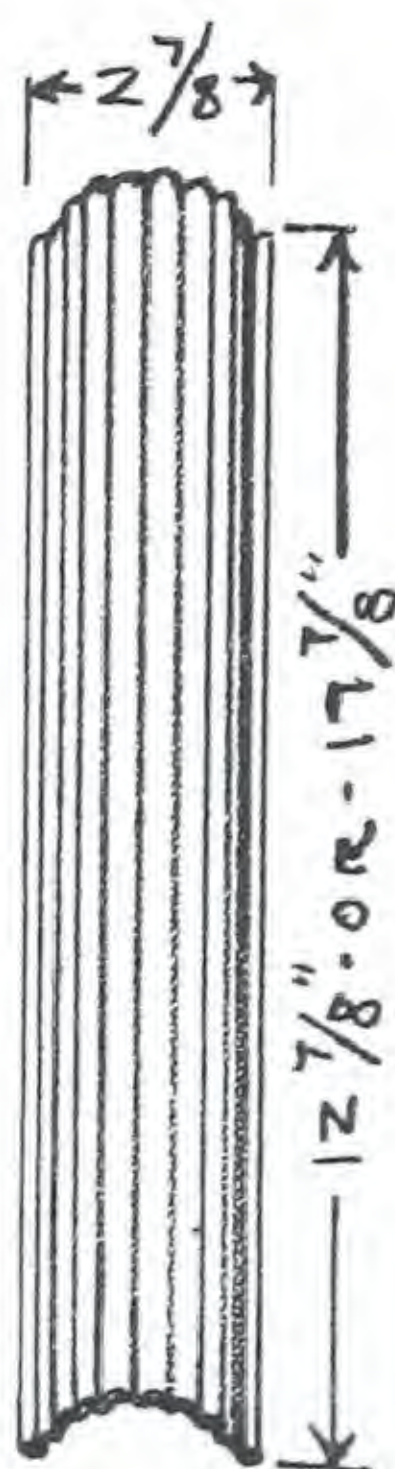
- ILLUMINATING - PLATE —
 — LUMITE - OR - ALVAX - GLASS —
 — #12109 - 6 1/2" SQ. - 1/4" THICK —
 — #12117 - 8" SQ. - 1/4" THICK —
 — #12120 - 12" SQ. - 1/4" THICK —



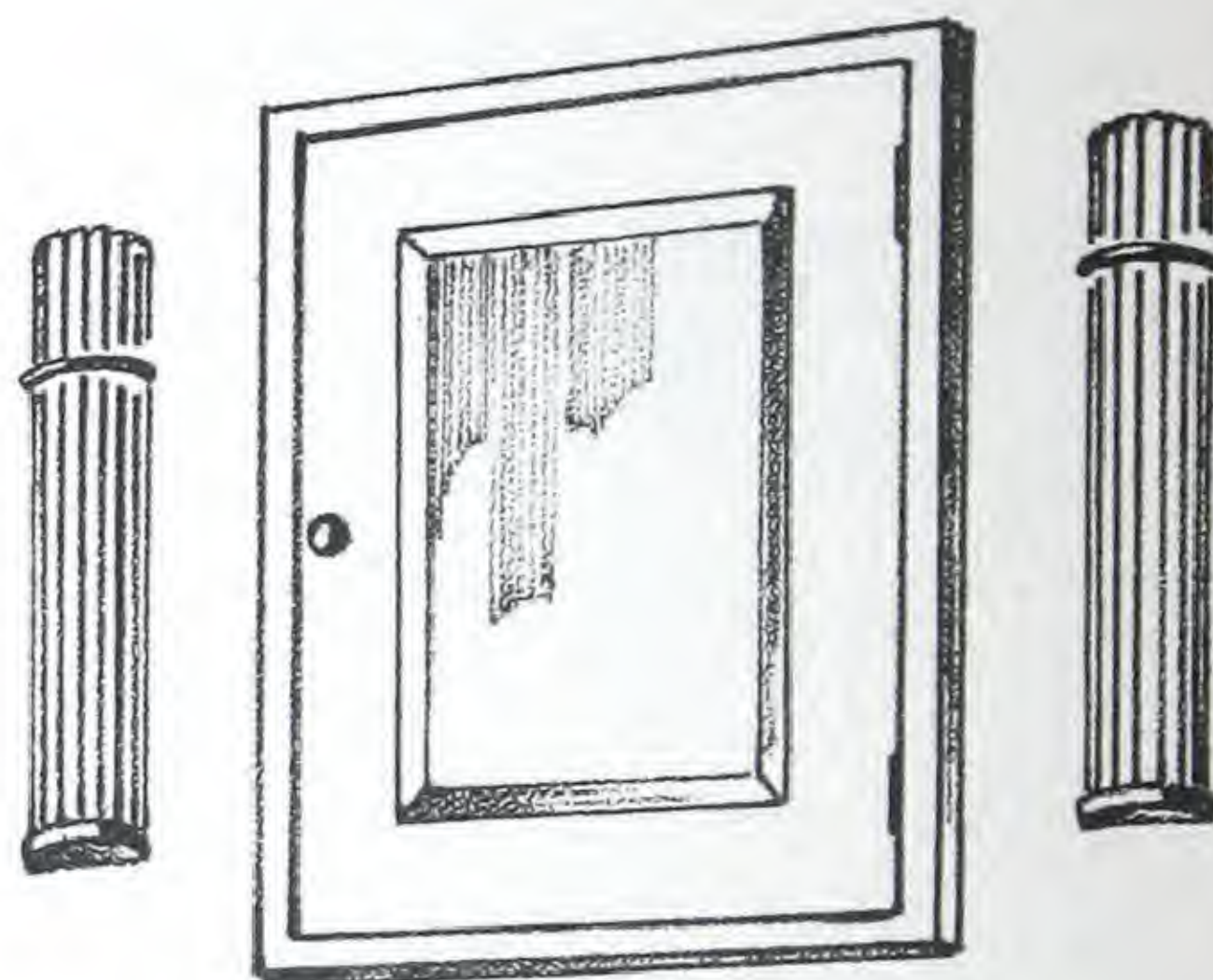
- FLUSH - CEILING - TYPE —
 — WITH - BUILT - IN - BOX —



- SLENDER - CYLINDER —
 — BRACKET —



- #12320 —
 — MONAX —
 — 1 1/2" DEEP —



- #12320 LUMILINE —
 — MONAX TROUGHS ARE —
 — PERFECT FOR CABINET —
 — LIGHTING —



- | — MONAX - CYLINDER — | |
|----------------------|-------------|
| DIA. | MAX. LENGTH |
| 2" | 21" |
| 2 1/2" | 14" |
| 3" | 18" |



- CYLINDER - BRACKET —
 — FOR - OVER - CABINET —



- HALF - CYLINDER —
 — BRACKET —

Bed Room and Nursery

A center ceiling fixture should be used in the bedroom to provide good general illumination. It should have low surface brightness. Where ceiling conditions permit, a semi-indirect bowl or globe is desirable. An enclosing globe with harmonious decorative treatment is suggested for direct lighting. It is extremely important that dense glass with low surface brightness be used in the nursery for the protection of young eyes.

A flush type panel in the base board is most desirable. This provides floor visibility with no general illumination in the room which might disturb a sleeping occupant.

An I. E. S. type lamp on a table at the head of the bed or a well shaded bed lamp is a necessary adjunct.

Adequate mirror illumination must be provided for make-up and dressing. Diffusing glass should be used to shade the light source.

Individual lights on door switches are desirable for the closets.

— HOME LIGHTING — BED ROOM & NURSERY —



— #1204GA-MONAX —
 — 11½" DIA. - 4¼" DEEP —
 — DRILLED-WITH-3-SIDE-HOLES —
 — ALSO AVAILABLE IN —
 — VARIOUS TINTED PASTEL —
 — COLORS —



— CHAIN-SUSPENSION-TYPE —



— CLOSE-UP-TYPE —



— CLOSE-UP —



— #12174 D178 DENAX-GREEN & TAN —
 — #12174 D172 " - IVORY & PINK —
 — #12174 D195 LUMITE-AMBER —
 — #12174 D194 LUMITE-PINK-GREEN-OR- —
 — 11" DIA. - 5¾" DEEP — - IVORY —
 — DRILLING - AS-SPECIFIED —



— CHAIN-SUSPENSION —



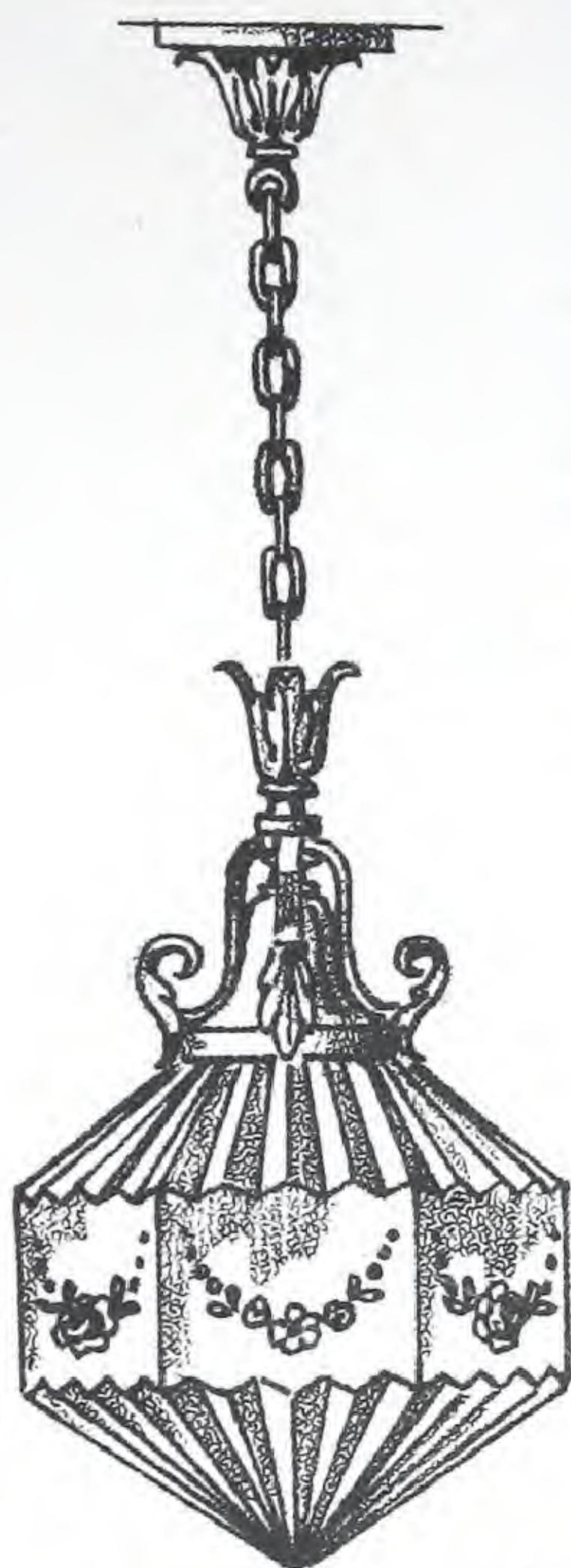
— PLAIN-MONAX-BOWL —
 — #12192 8" DIA. 3" DEEP —
 — #12146 10" DIA. 3½" DEEP —
 — #12147 12" DIA. 4" DEEP —
 — #12148 14¼" DIA. 4½" DEEP —
 — DRILLED-WITH-½" CENTER-HOLE —
 — AVAILABLE-ALSO-IN-IVORIAN-GLASS —



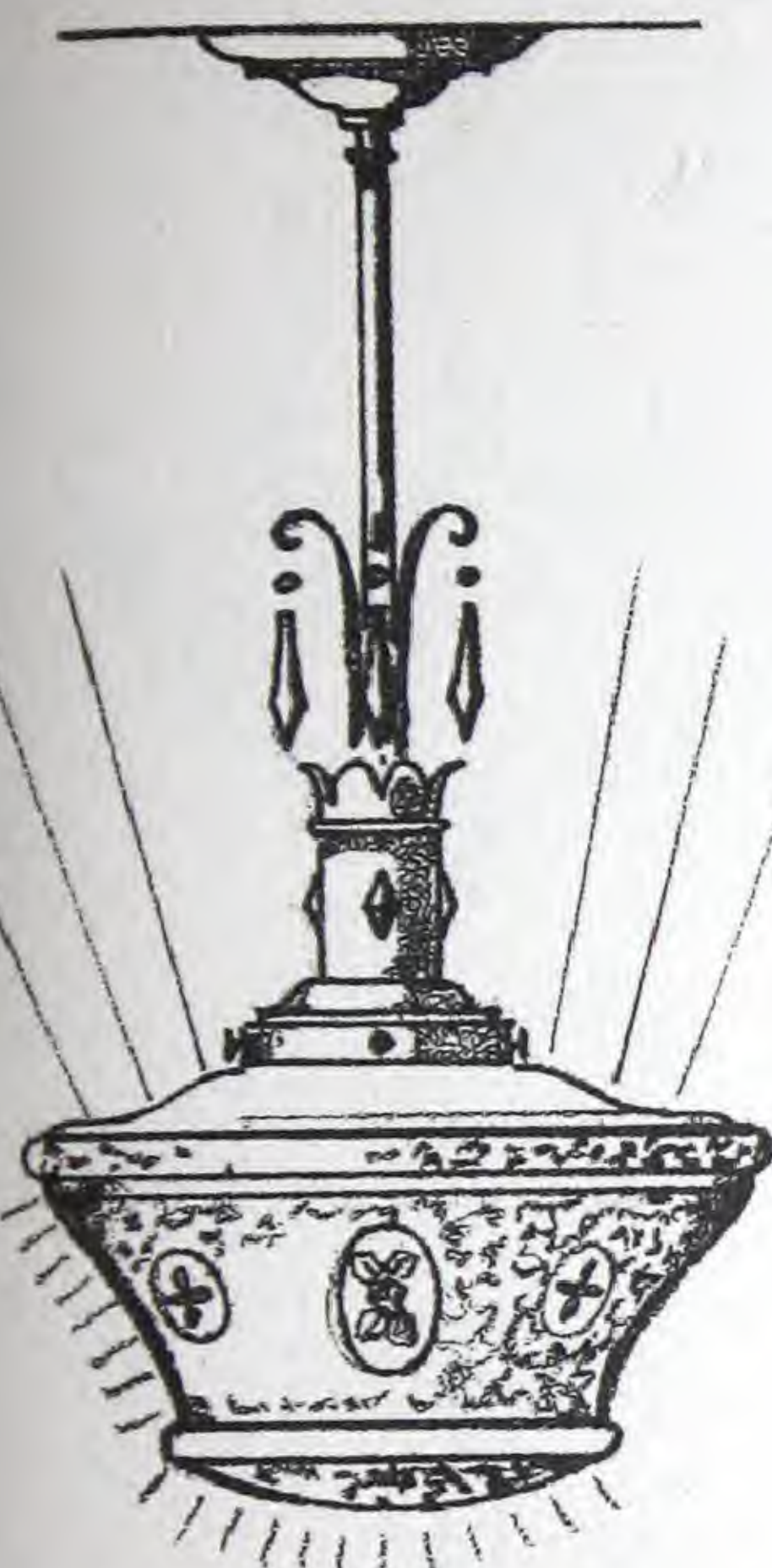
— HOME LIGHTING - BED ROOM & NURSERY —



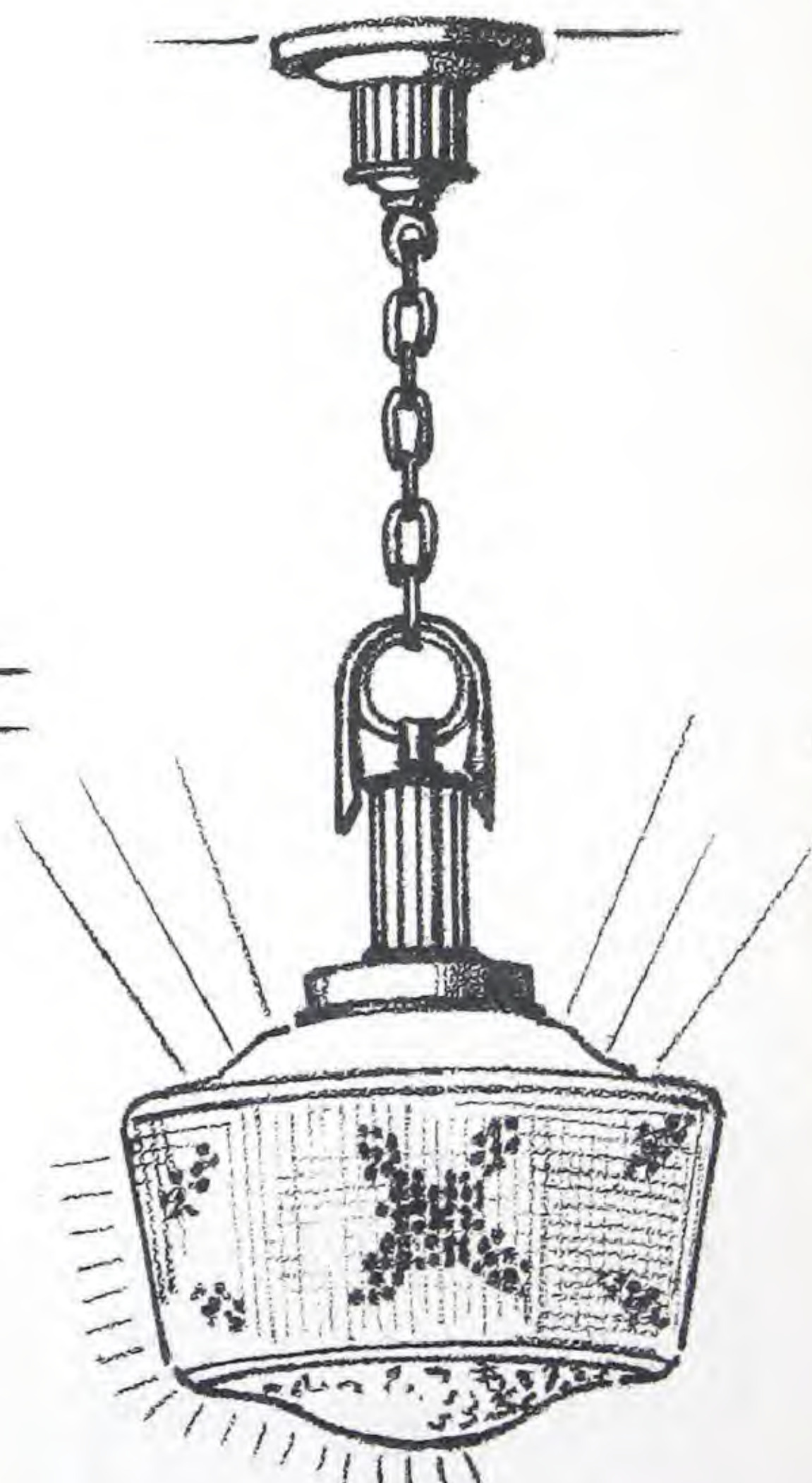
— # 2334-D192-MONAX —
 — DIA. - $8\frac{1}{2}$ " - HEIGHT $8\frac{7}{8}$ " —
 — FITTER - 4" —
 — BACKGROUND OF PINK —
 — GREEN OR IVORY —



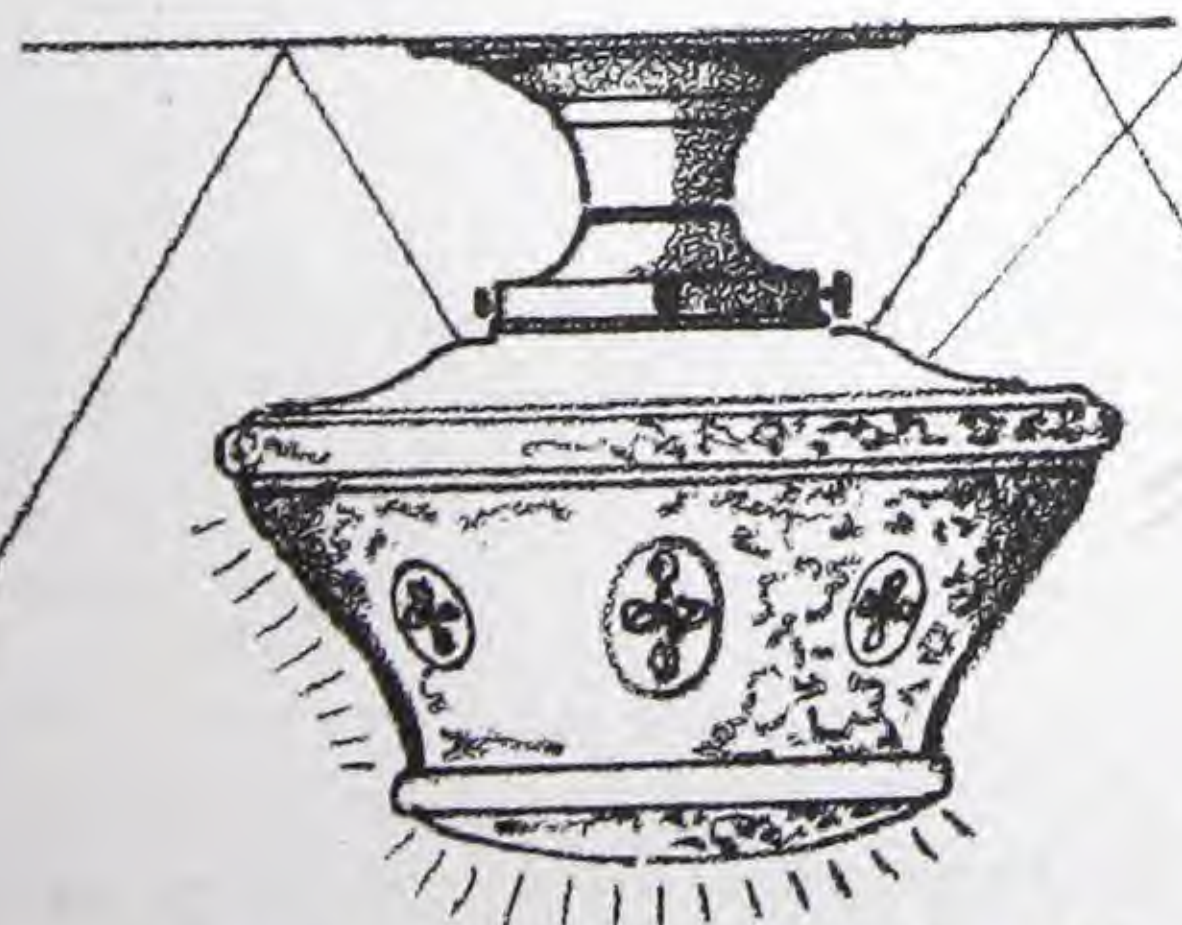
— # 2334 D192 MONAX —
 — CHAIN-SUSPENSION —



— # 5952-ESS-MONAX —
 — $10\frac{3}{8}$ " DIAMETER —
 — $6\frac{7}{8}$ " DEEP —
 — 4" FITTER —
 SURFACE-ETCHED-PASTEL-COLORS —
 — STEM-SUSPENSION —



— # 5881 E53 - MONAX —
 — 9" DIA. $6\frac{3}{4}$ HIGH —
 — 4" FITTER —
 — ETCHED-AND-DECORATED-IN —
 — PASTEL-COLORS —

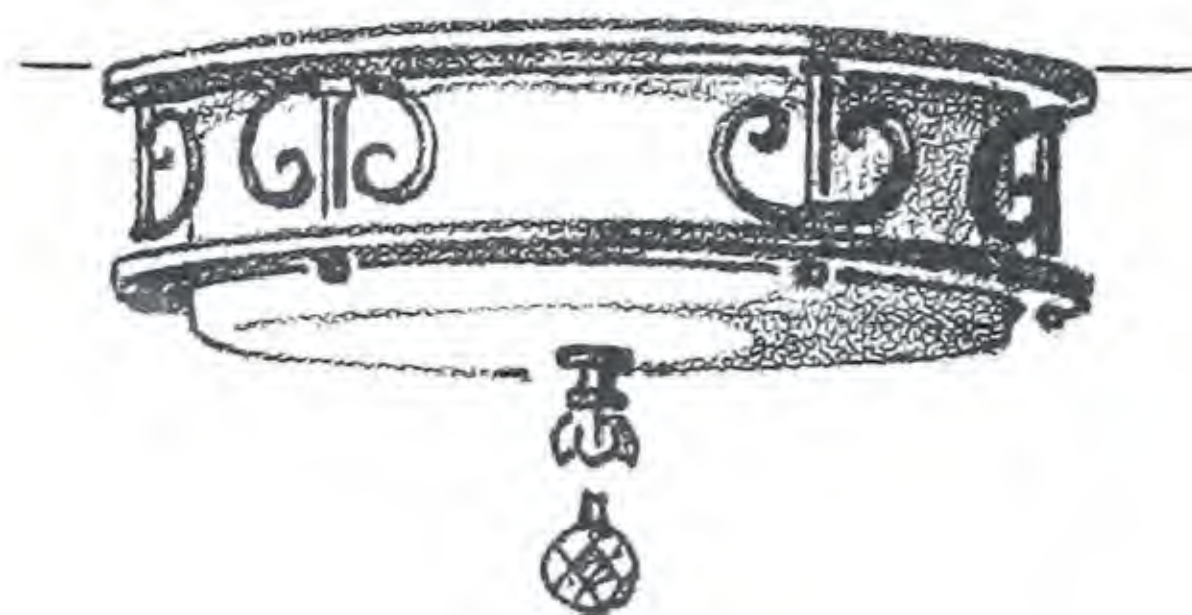


— # 5952 E55-AS-CLOSE-UP —

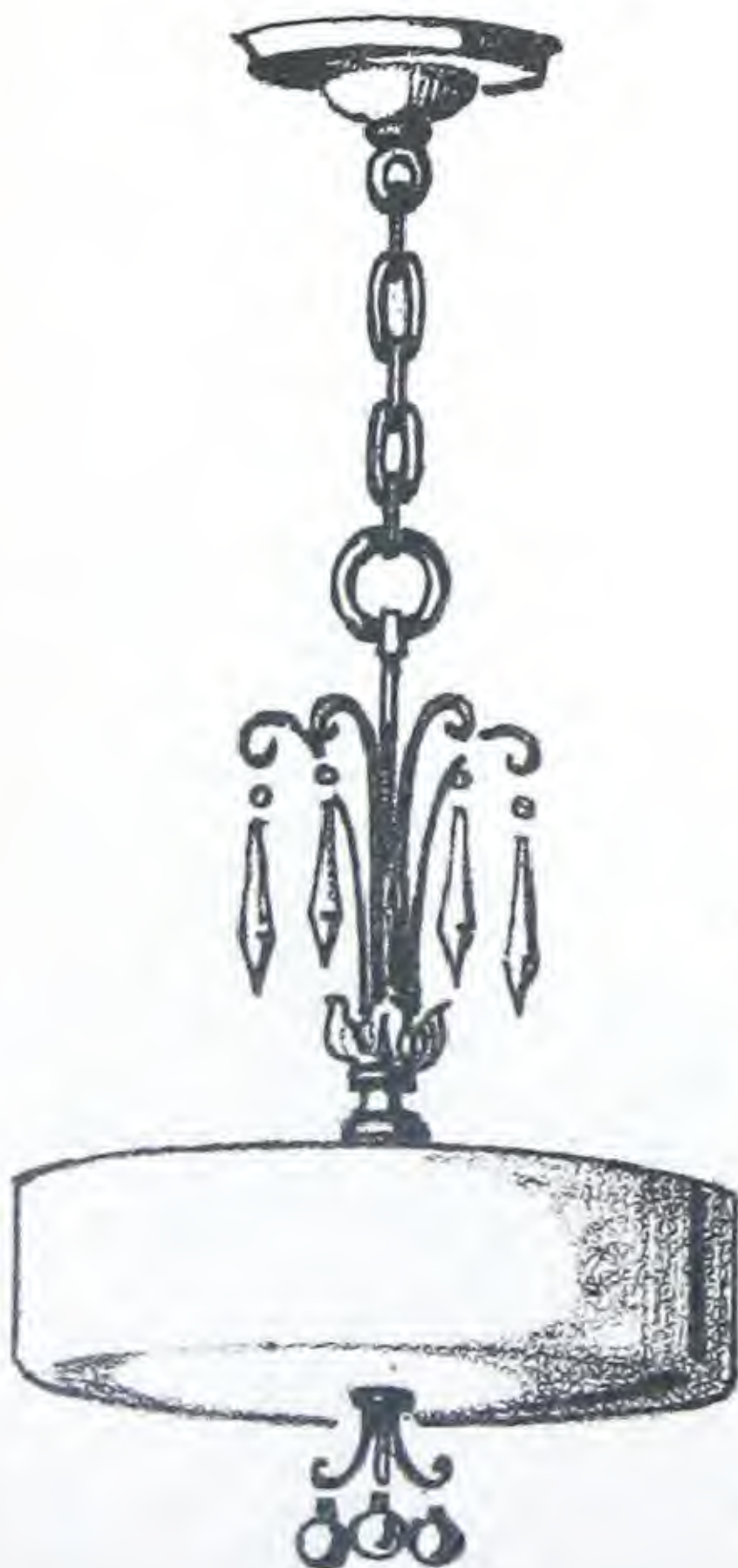
— HOME LIGHTING — BED ROOM & NURSERY —



— FOR. LOW. CEILINGS —



— CHAIN-SUSPENSION —



— CHAIN - SUSPENSION —



- ROUND. MONAX - BOWLS —
 — #12192 - 8" DIA. - 3" DEEP —
 — #12146 - 10" DIA. - 3 1/2" DEEP —
 — #12147 - 12" DIA. - 4" DEEP —
 — #12148 - 14 1/4" DIA. - 4 1/2" DEEP —
 — #12195 - 16" DIA. - 5" DEEP —
 — DRILLED 1/2" BOTTOM HOLE —
 — AVAILABLE - IN - IVORIAN - GLASS —



- ROUND MONAX BOWL —
 — NOUVELLE ETCHED & TONED —
 — #9007 E 58 8" DIA. 3 1/8" DEEP —
 — #4999 E 58 10" DIA. 3 1/8" DEEP —
 — #5012 E 58 12" DIA. 3 3/4" DEEP —
 — #5013 E 58 14 1/4" DIA. 4 7/16" DEEP —
 — #5014 E 58 16" DIA. 5" DEEP —
 — DRILLED - WITH - 1/2" - BOTTOM - HOLE

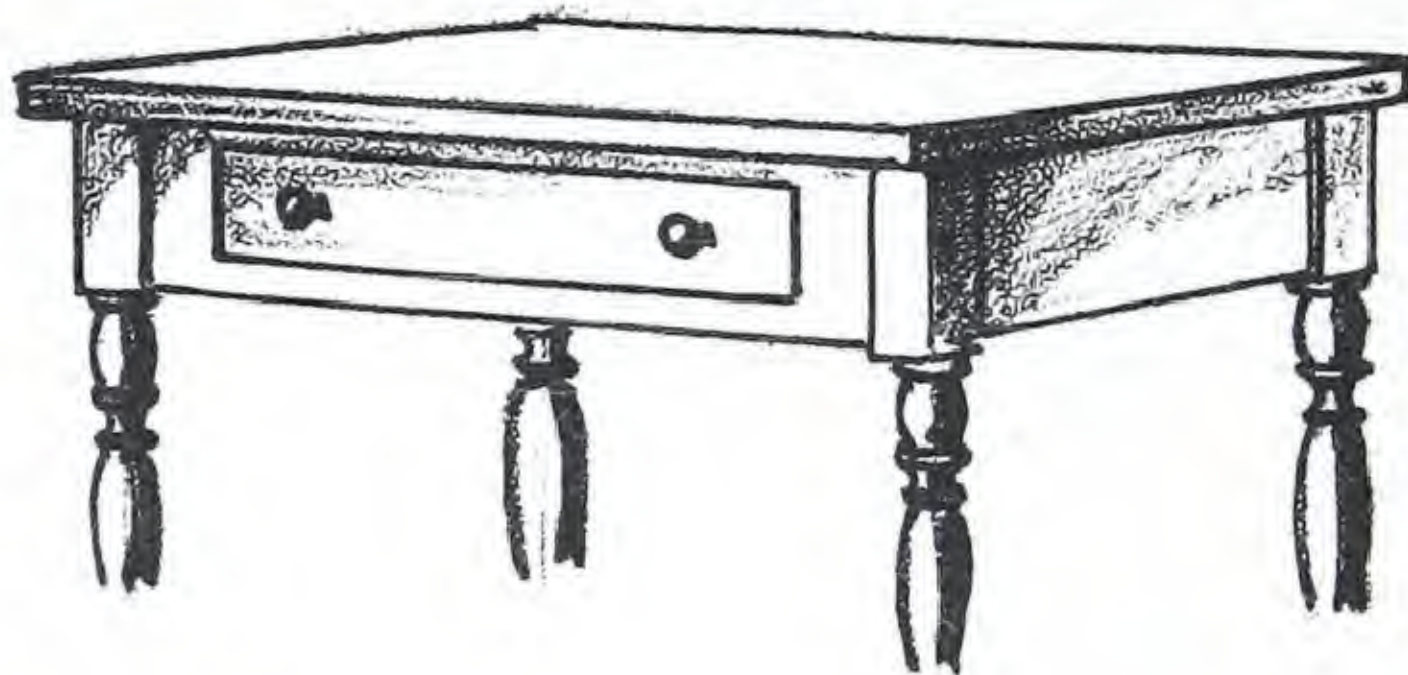
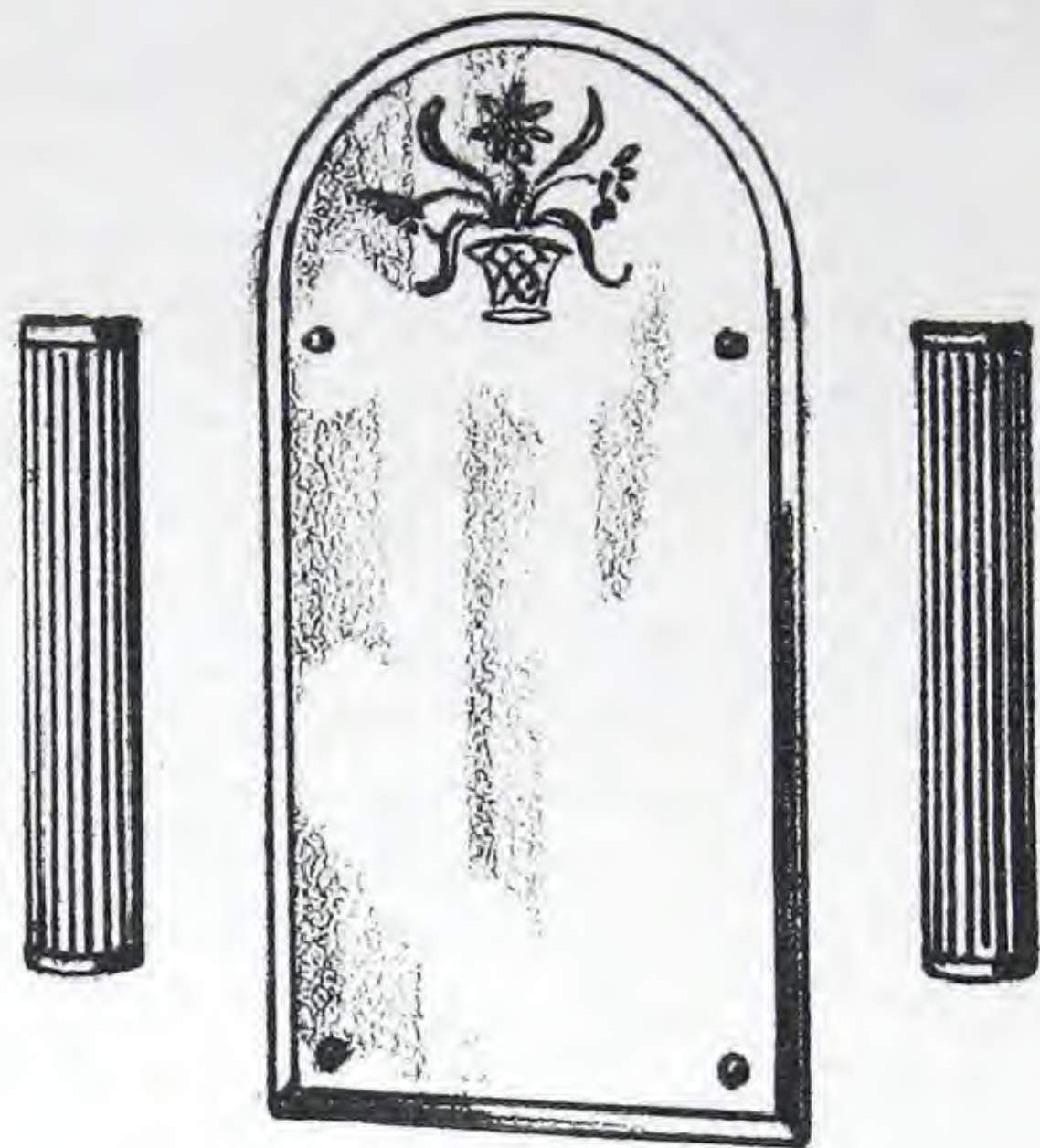
HOME LIGHTING — BED ROOM & NURSERY —

← 2 ⁷/₈ " →

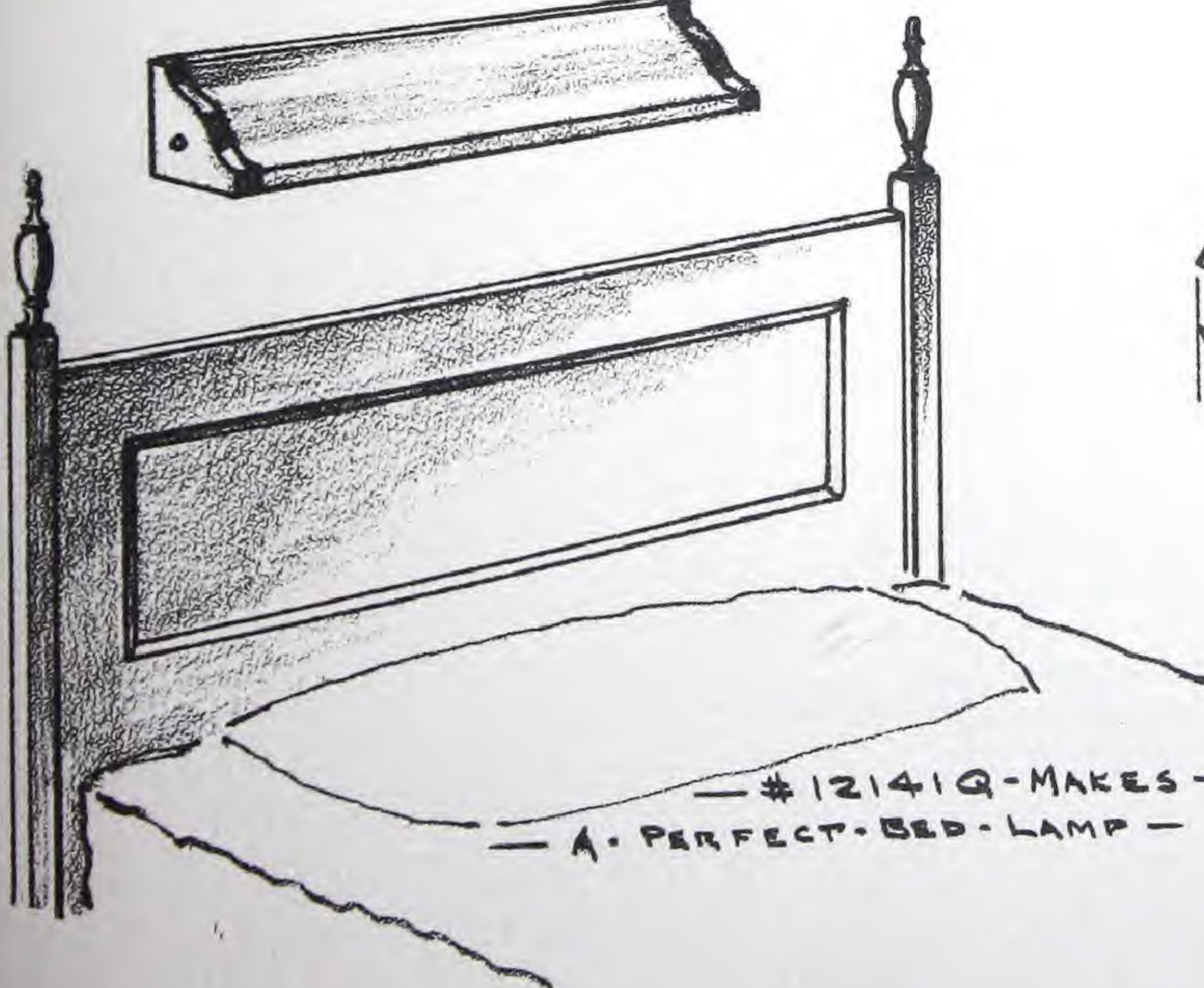


↑ 12 ⁷/₈ " OR 17 ⁷/₈ " LONG ↓

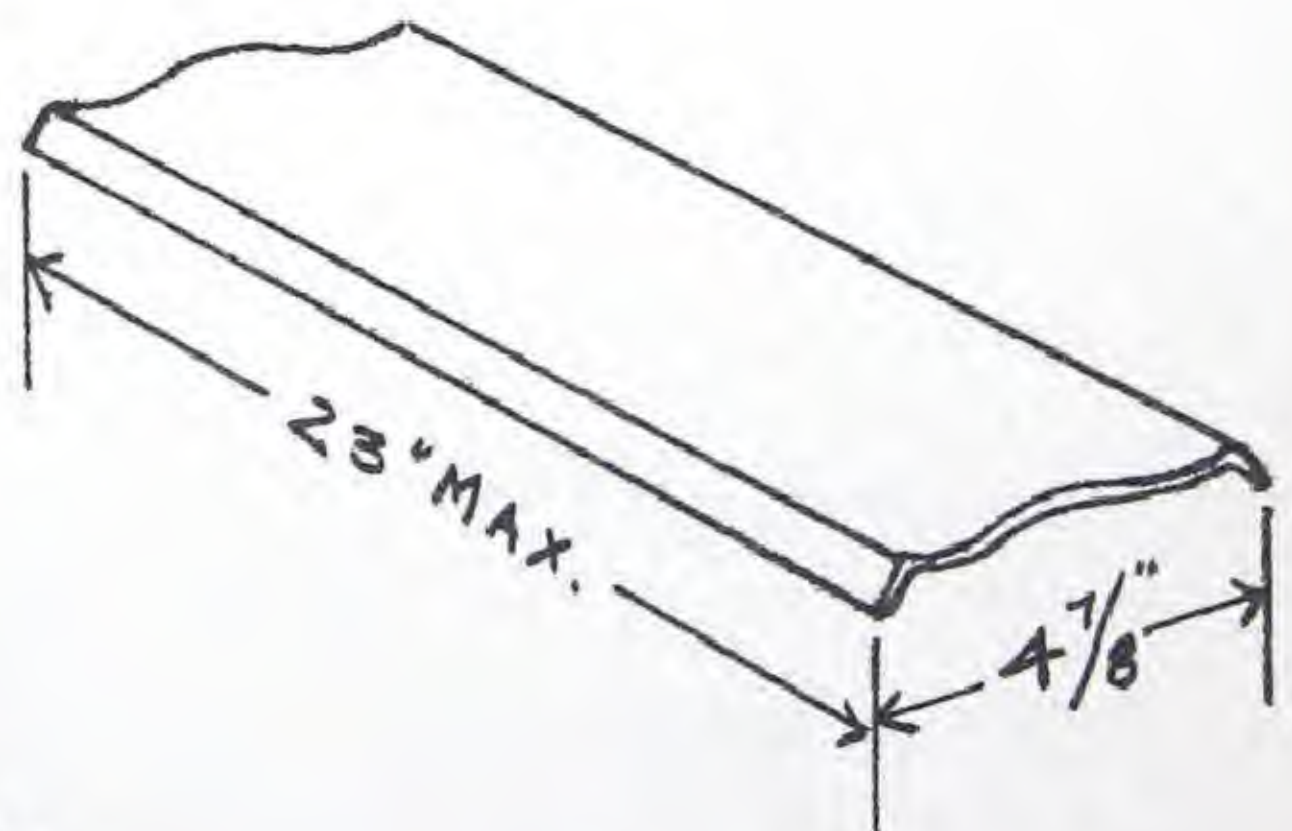
— # 12320 MONAX —
— LUMILINE - STRIP —
— 1 ¹/₂ " DEEP —



— # 12320 - LUMILINE - STRIP —
— FOR - LIGHTING - THE - DRESSING —
— TABLE —



— # 12141 Q - MAKES —
— A - PERFECT - BED - LAMP —



— # 12141 Q —
— MONAX —

— CORNING - GLASS - WORKS —

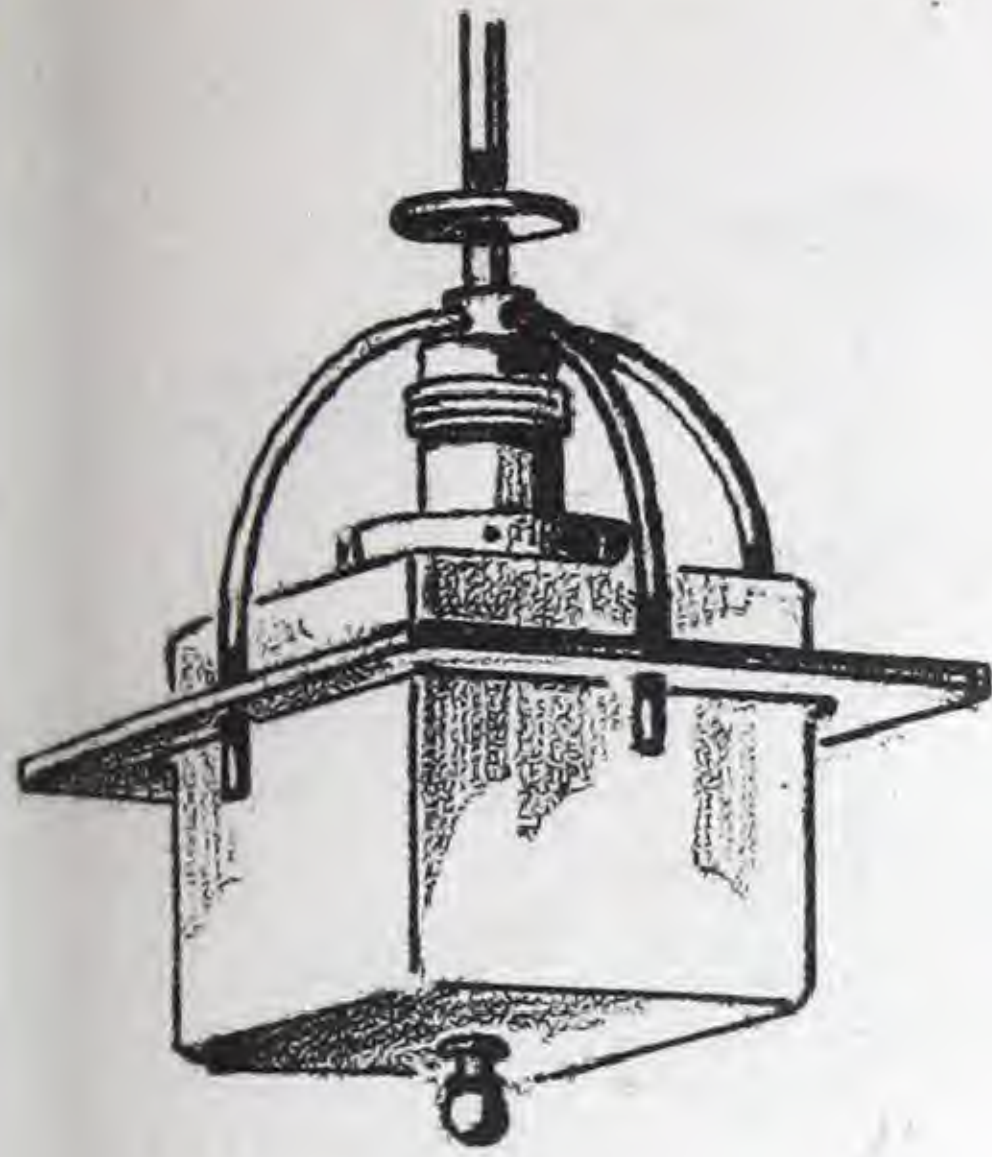
Basement and Garage

Recreation Room

The lighting of the basement and garage is largely utilitarian. Should part of the basement be used as a recreation room, a closely mounted bowl or cube globe of diffusing glass suitably decorated and convenience outlets to allow the use of "I.E.S." floor lamps are recommended.

A MONAX glass enclosing globe located in the center of each working area is suggested for the laundry and furnace room. For example a globe should be located above and in front of the laundry tubs, another above the ironer, a third above and immediately in front of the furnace door. Glassteel diffusers are recommended for the garage and work shop.

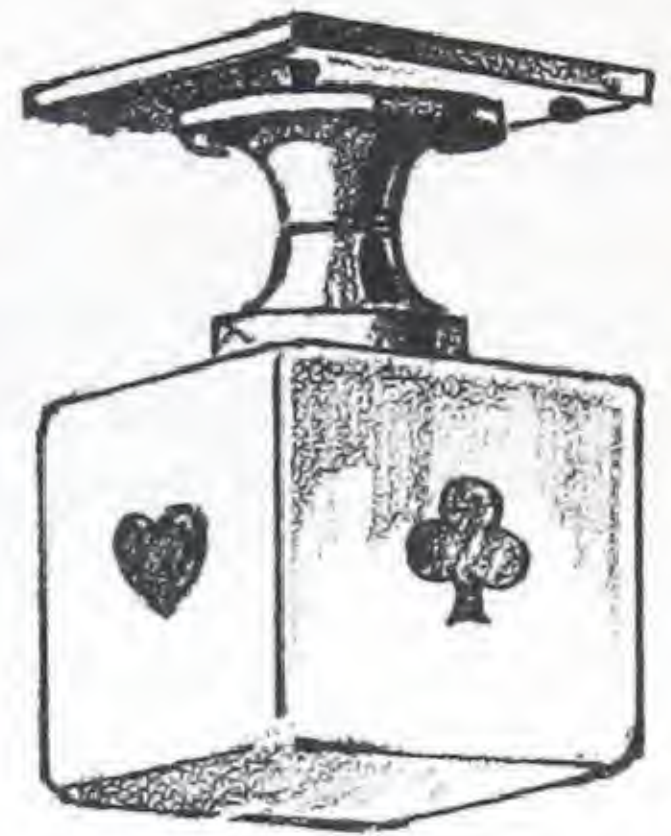
— HOME LIGHTING — BASEMENT RECREATION —



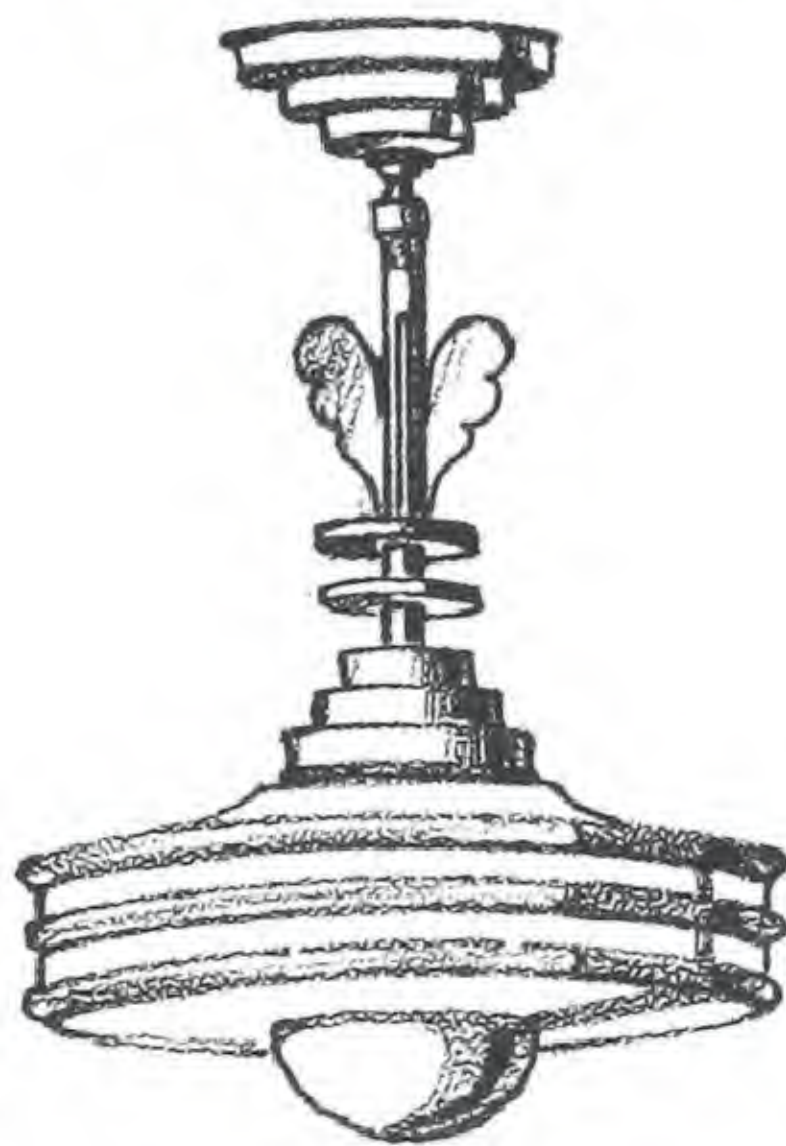
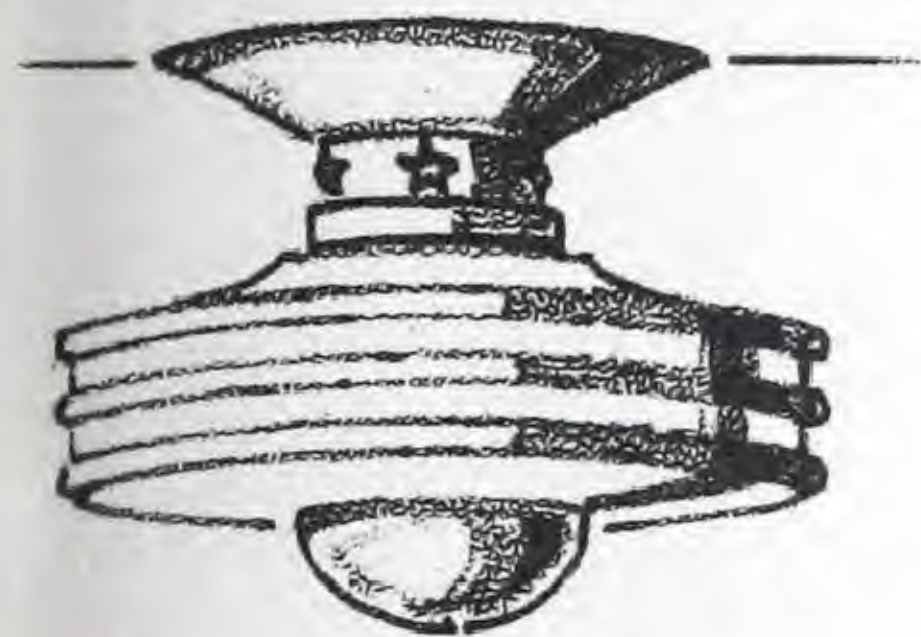
— "THE CUBE" —
— MONAX —



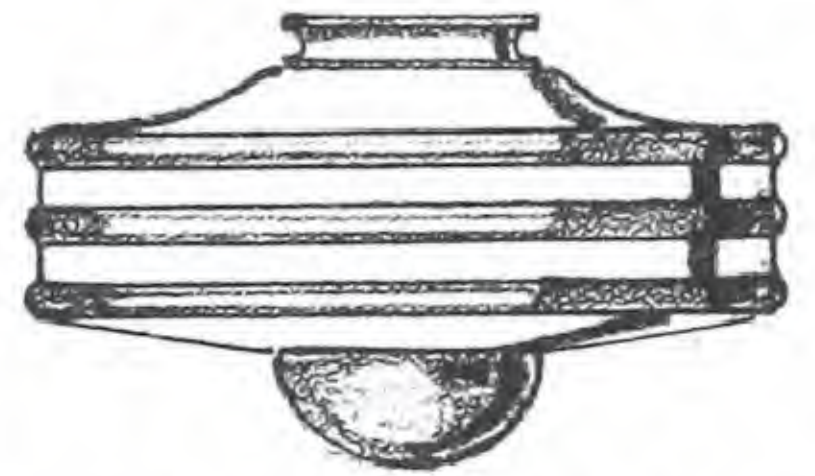
- #12087 - 4 3/8" SQ. - 3 1/4" FITTER —
- #2347 - 6" SQ. 3 1/4" FITTER —
- #12089 - 7" SQ. 4" FITTER —
- #12088 - 8" SQ. 4" FITTER —



THE - FLAT SIDES
OF MONAX CUBES
LEND THEMSELVES
TO THE APPLICATION
OF DESIGNS



"THE SILVAX"

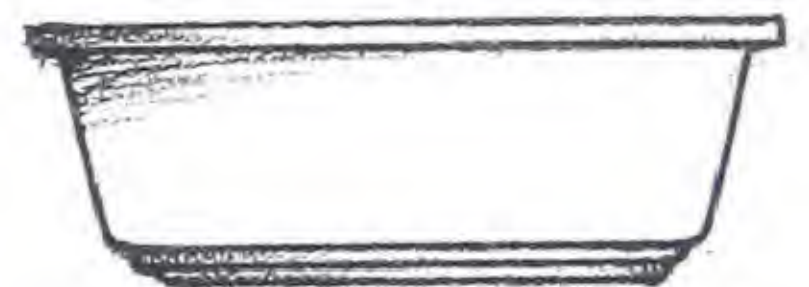
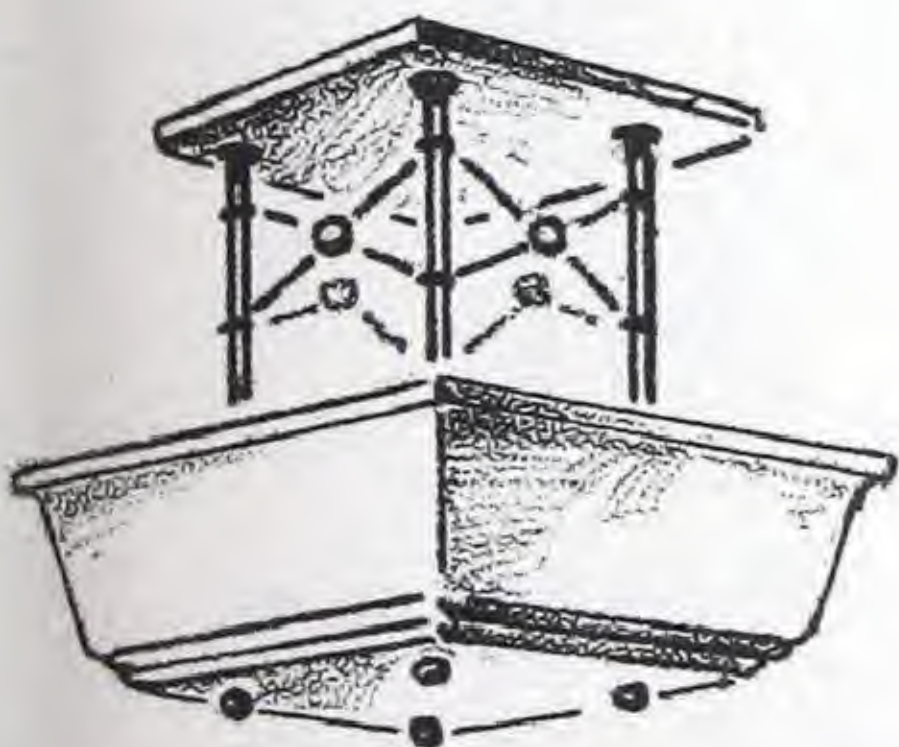


— FOR - LOW - CEILINGS —

— MONAX - GLASS —

— ALUMINUM - BANDS - 8 - CUP —

- #12031 - D160 - 10" DIA. - 4" FITTER —
- #12032 - D160 - 12" DIA. - 4" FITTER —
- #12033 - D160 - 14" DIA. - 6" FITTER —
- #12034 - D160 - 16" DIA. - 6" FITTER —

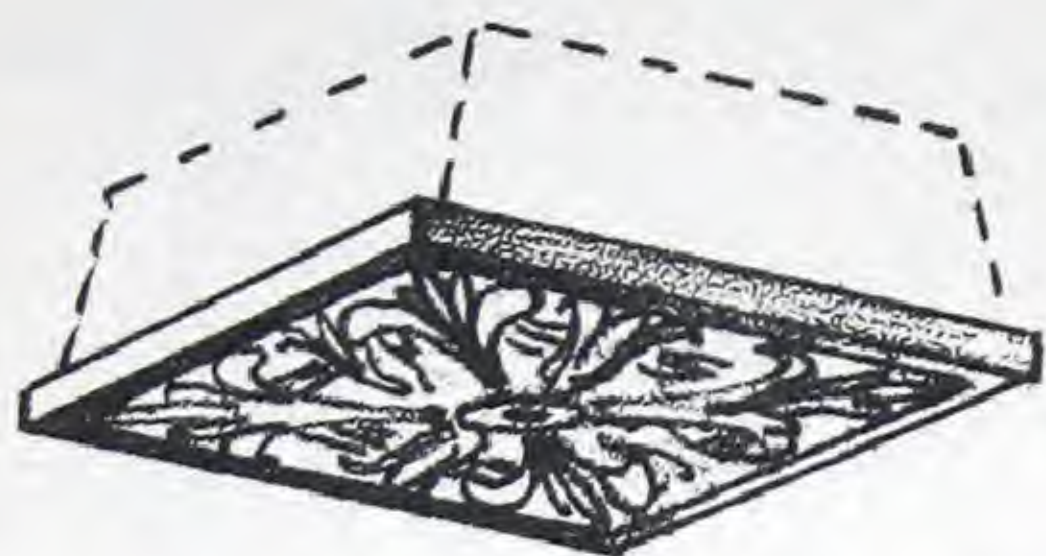


— MODERN - SQUARE - BOWL —

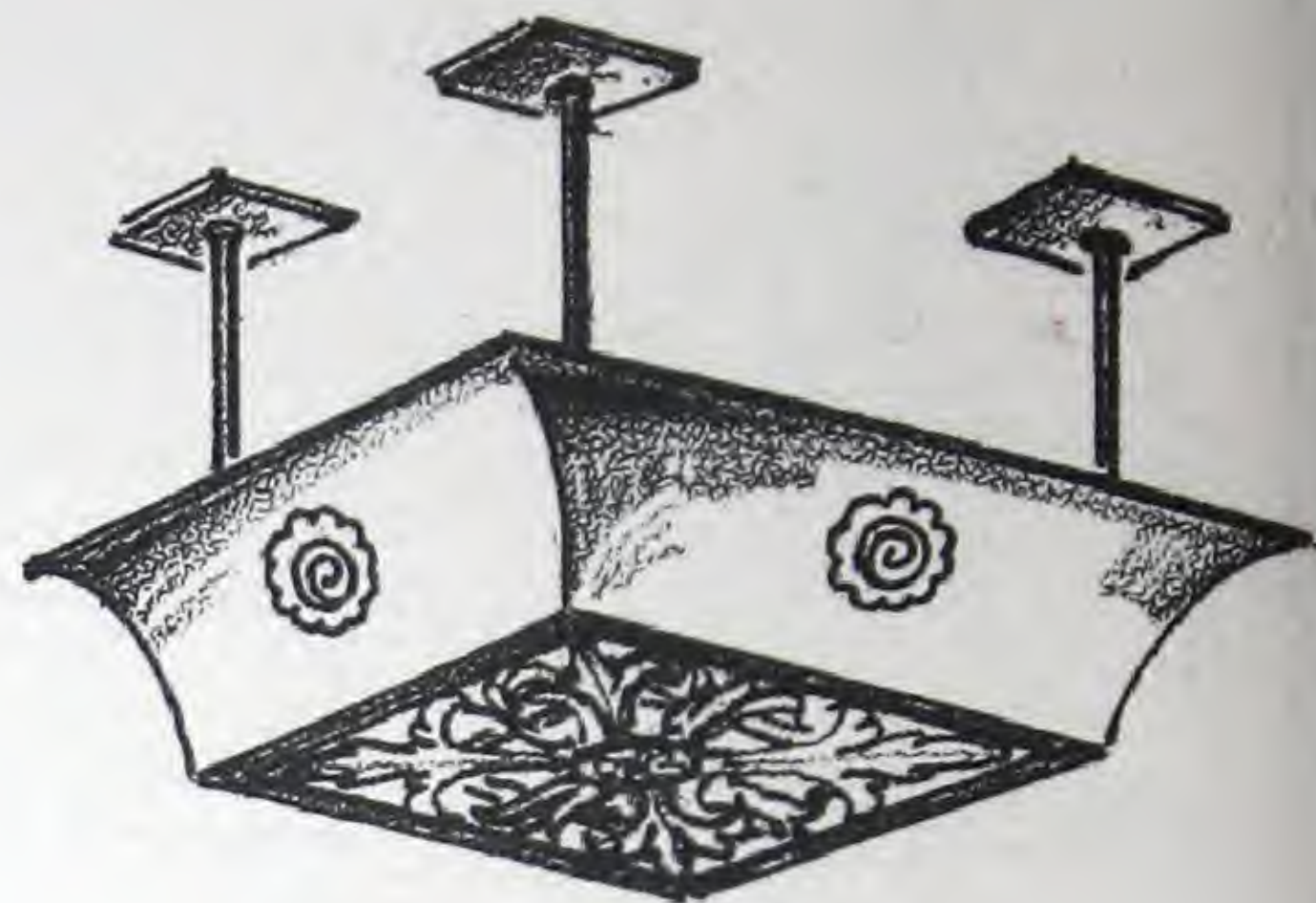
— MONAX - OR - LUMITE - (SATIN) —

- #12142 - 10 3/4" DIA. - 3 3/4" DEEP. —
- #12143 - 12 3/4" DIA. - 4 1/2" DEEP. —

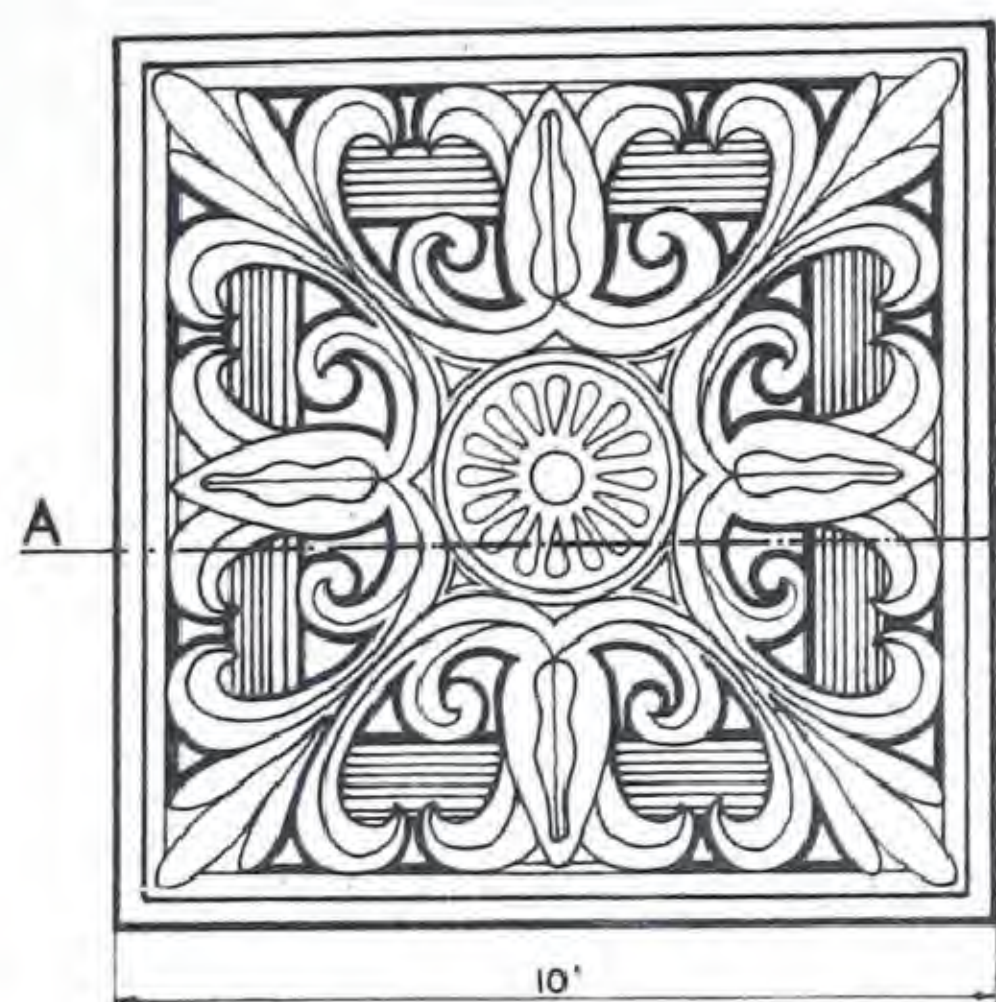
— HOME LIGHTING — BASEMENT RECREATION —



— FLUSH TYPE WITH BUILT-IN —
— BOX —

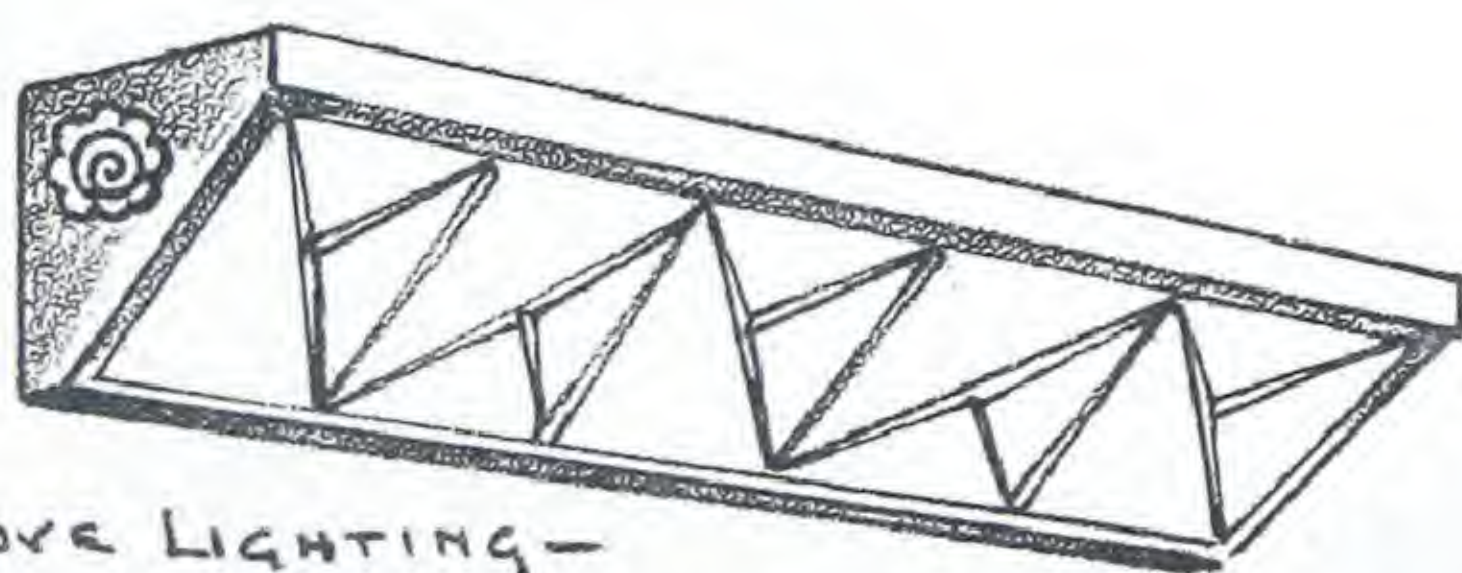


— SHORT SUSPENSION —
— TYPE —
— USE OVER GAME TABLES —

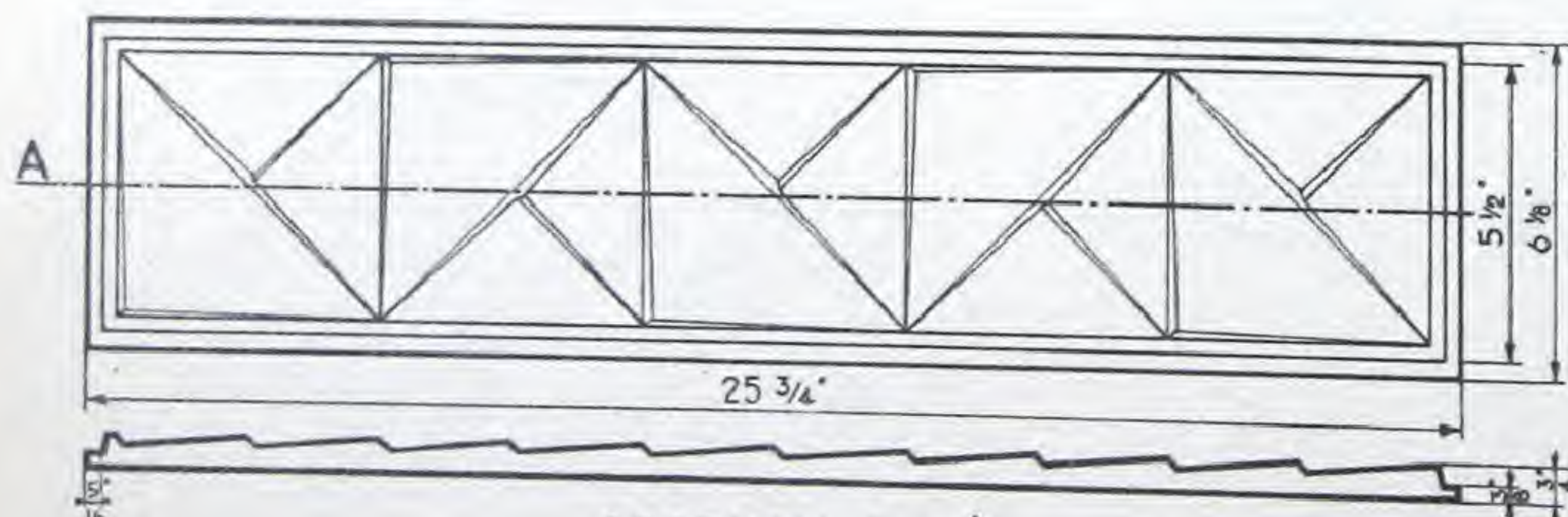


SECTION ON A

2015
— CLEAR OR FROSTED —



— COVE LIGHTING —
— INDIVIDUAL UNITS OR CONTINUOUS —
— AROUND ROOM —

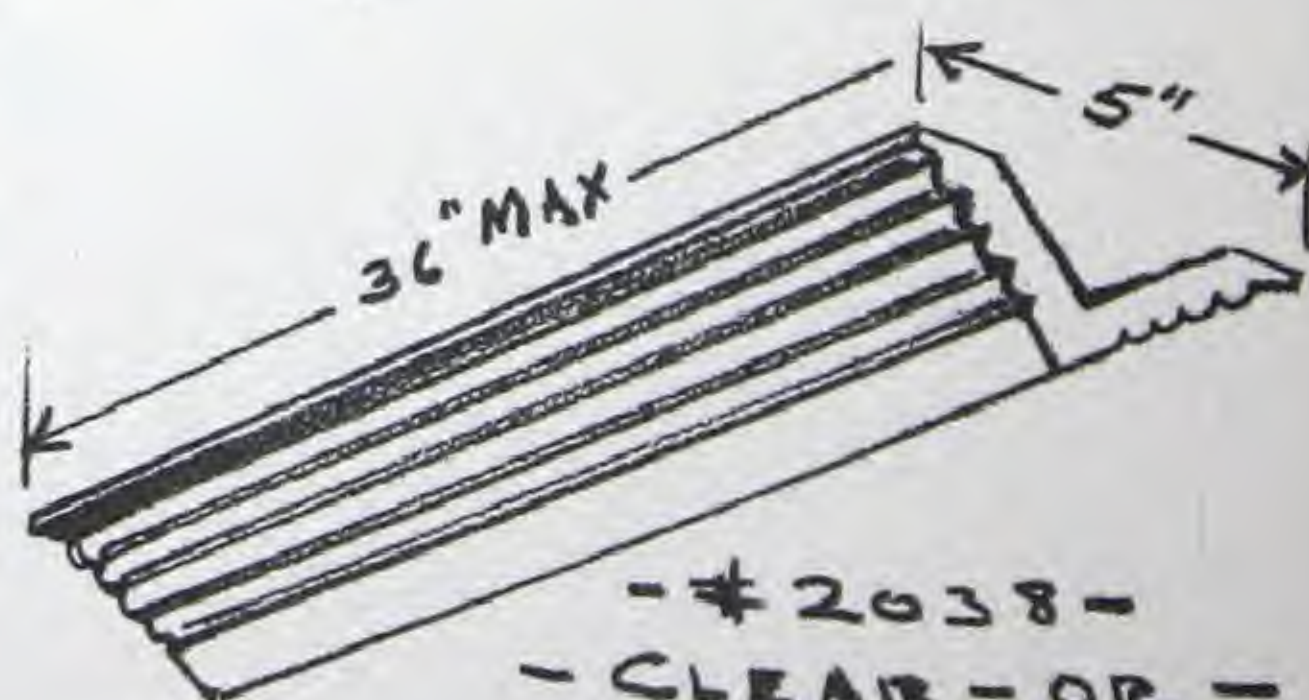


SECTION ON A

— # 2133 — CLEAR OR FROSTED —



— WALL BRACKET —



— # 2038 —
— CLEAR OR —
— FROSTED —
— 2" DEEP —

Modern Interiors

Today an architect can make light a "part of" instead of an "adjunct to" the interior of his building. The electric lamp has enabled him to cast off the fetters of candlestick and oil flame. Light as well as lighting equipment may now become an actual part of interior decoration in architecture.

The great flexibility of modern illuminants enables the architect to light the articles to be seen, to feature areas and spaces and to create decorative effects and provide correct illumination. Good lighting should conform to the following fundamental principles -

A - There must be general illumination sufficient for eye comfort and good appearance. Good appearance implies that due consideration be given shadows and highlights to achieve the desired effect. Glass is the medium by which these effects may be achieved.

B - The light sources themselves must be of correct visual value. Domination of the visual field by the light source may be avoided through the judicious use of glass.

C - Glare, defined as "visual discomfort" must be eliminated. Glare may be produced by excessively bright lights, specular reflections or severe contrasts of light and shadow. Glass which correctly controls and diffuses the light at its source eliminates glare.

D - The amount of illumination may vary depending on the task at a given location. The attractive power of greater illumination should be used to focus attention toward certain areas. Proper glass will direct the light from its source to the area which is to be illuminated.

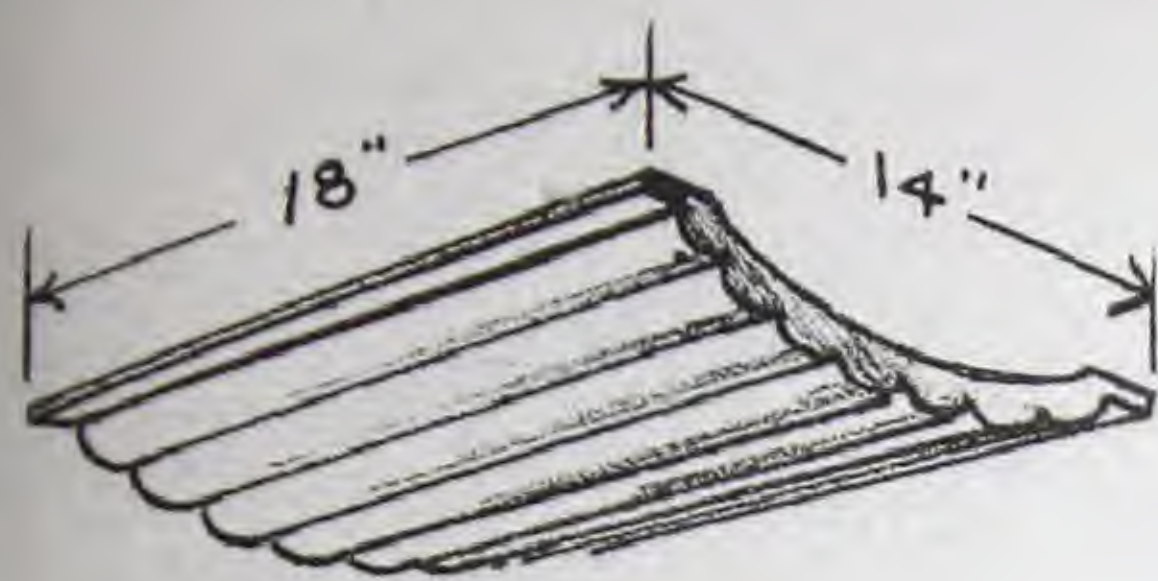
E - The general illumination may be used to influence the mood of an occupant. There are important psychological reactions to light and color which should be considered in designing modern illumination. Various colors and tones of glass may be utilized to achieve the desired results.

F - The appearance of the light sources, should be carefully related to the style and decorative treatment of the room. In style, shape and finish, glass should harmonize, both lighted and unlighted, with the architectural character of the room.

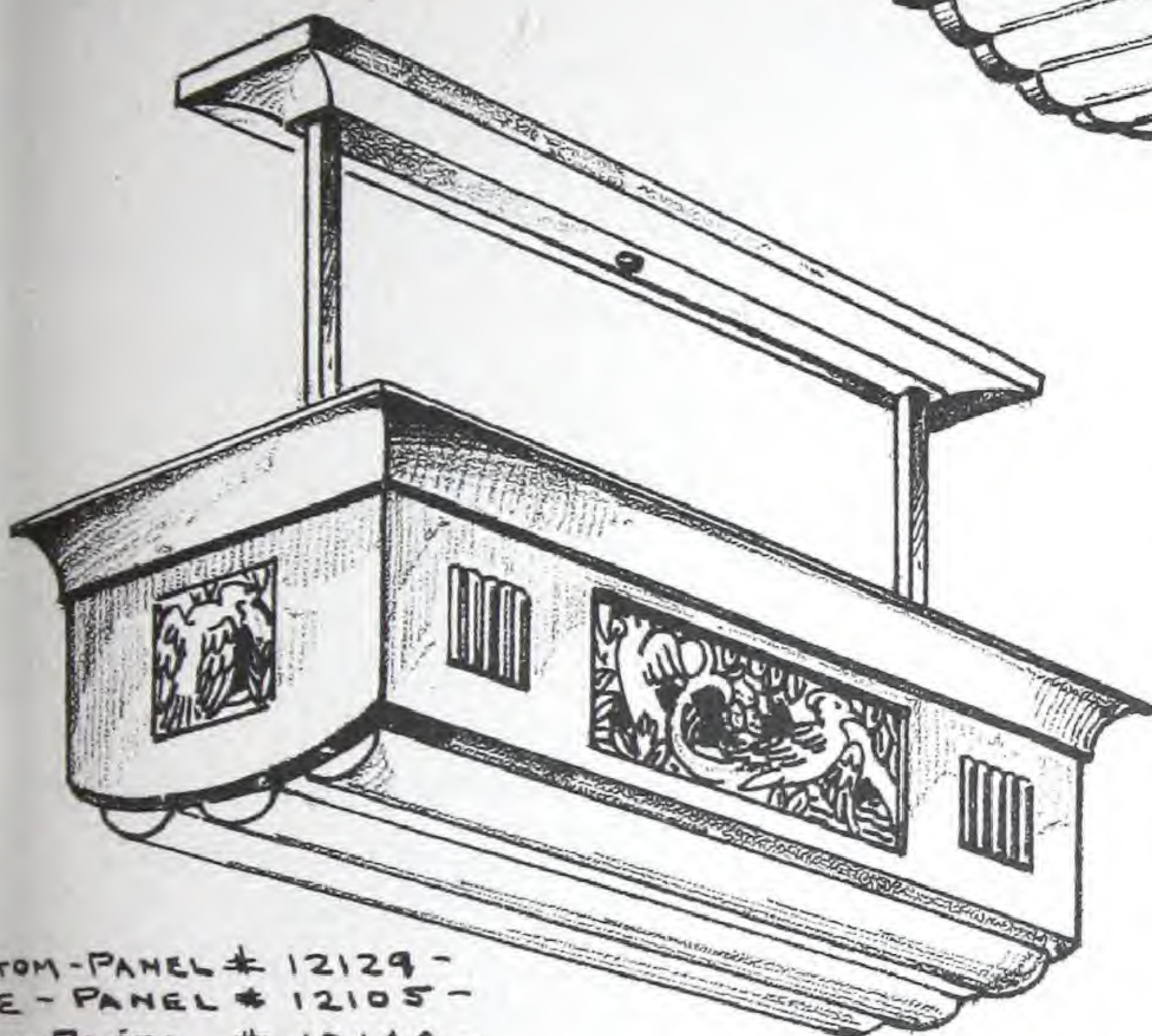
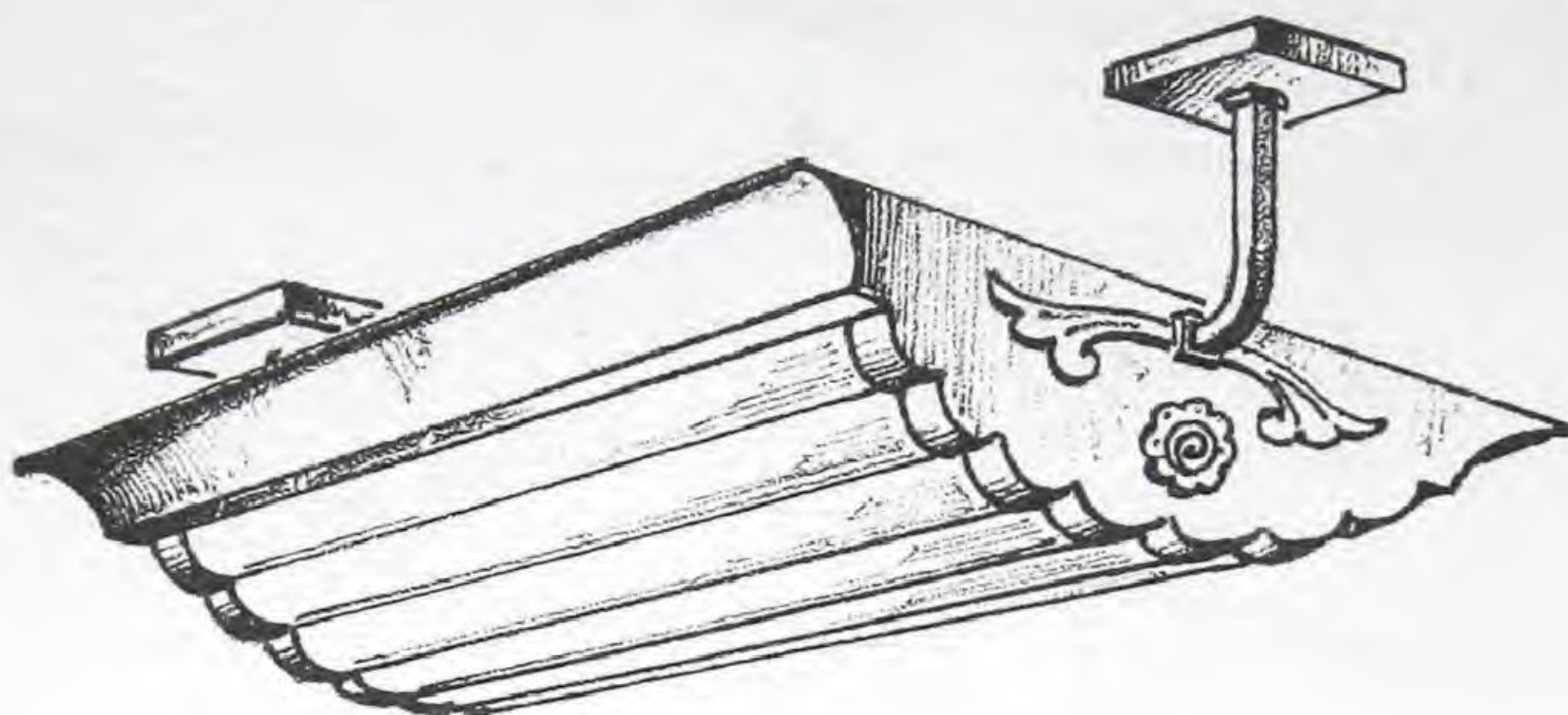
Glass is the most valuable medium for expression with light. The varieties of glass texture and design are such that they can be adapted more readily to the varying requirements of interior lighting projects than any other medium.

Glass can be made in almost any shape to meet the designer's requirements. The permanency of glass should always be remembered. Standard forms are available in various glasses and textures. They can be used to solve the lighting and decorative problems of many interiors. These can be employed in a multiplicity of compositions dependent upon the designer's ingenuity. A saving is effected in the initial expenditure by the employment, wherever possible, of standard elements; however special forms and textures are often required to meet a particular design problem.

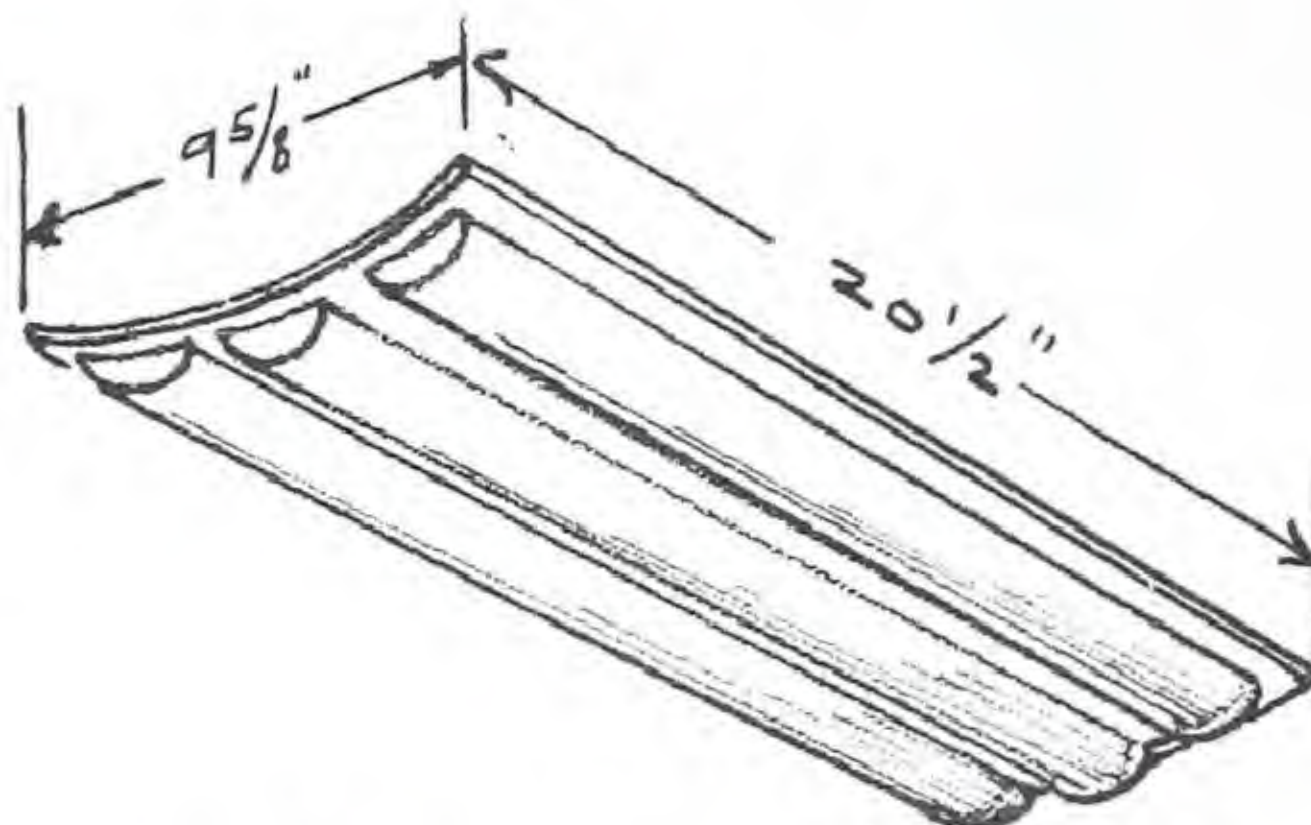
— MODERN INTERIORS —
 — THE CEILING AS THE SOURCE OF LIGHT —



— #2052 —
 — CLEAR-OR-FROSTED —
 — $3\frac{3}{4}$ " DEEP —



— BOTTOM-PANEL # 12129 —
 — SIDE-PANEL # 12105 —
 — END-PANEL # 12144 —



— #12129 —
 — LUMITE-SATIN-FINISH —
 — OR-AMBERTONE —

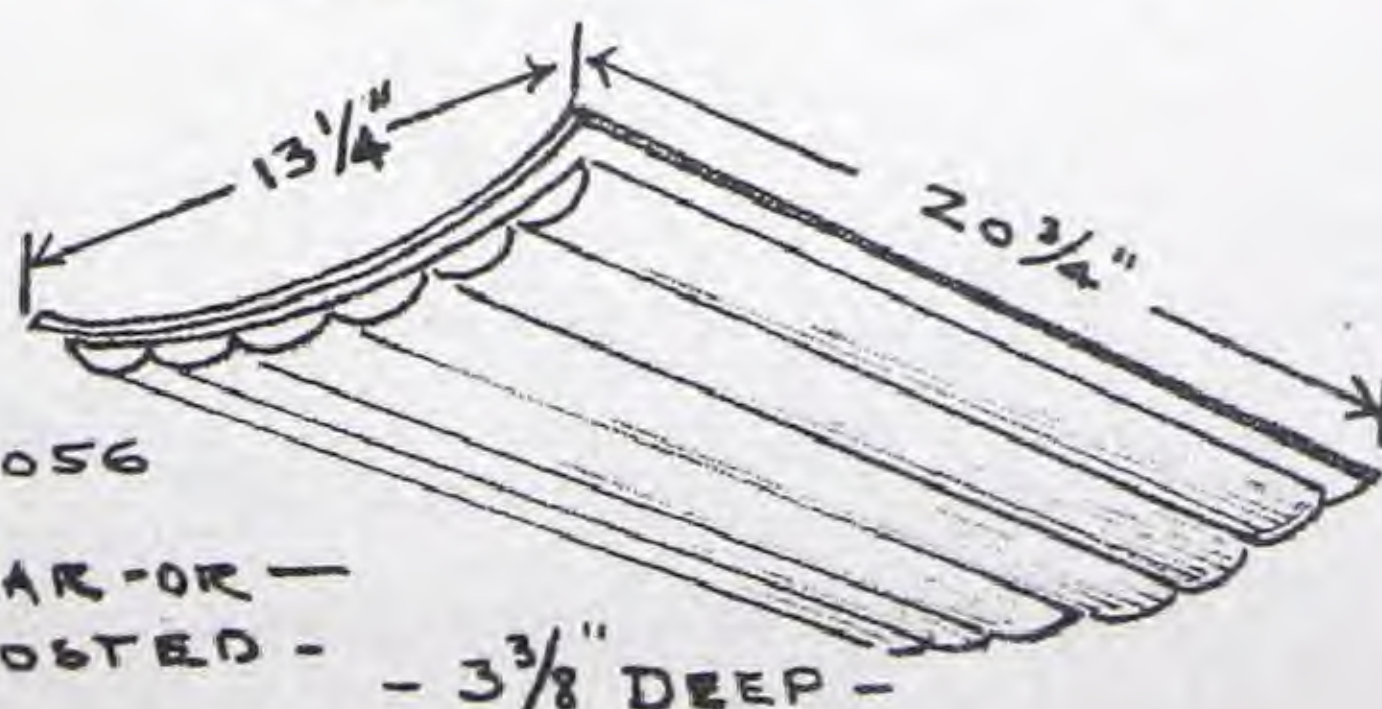
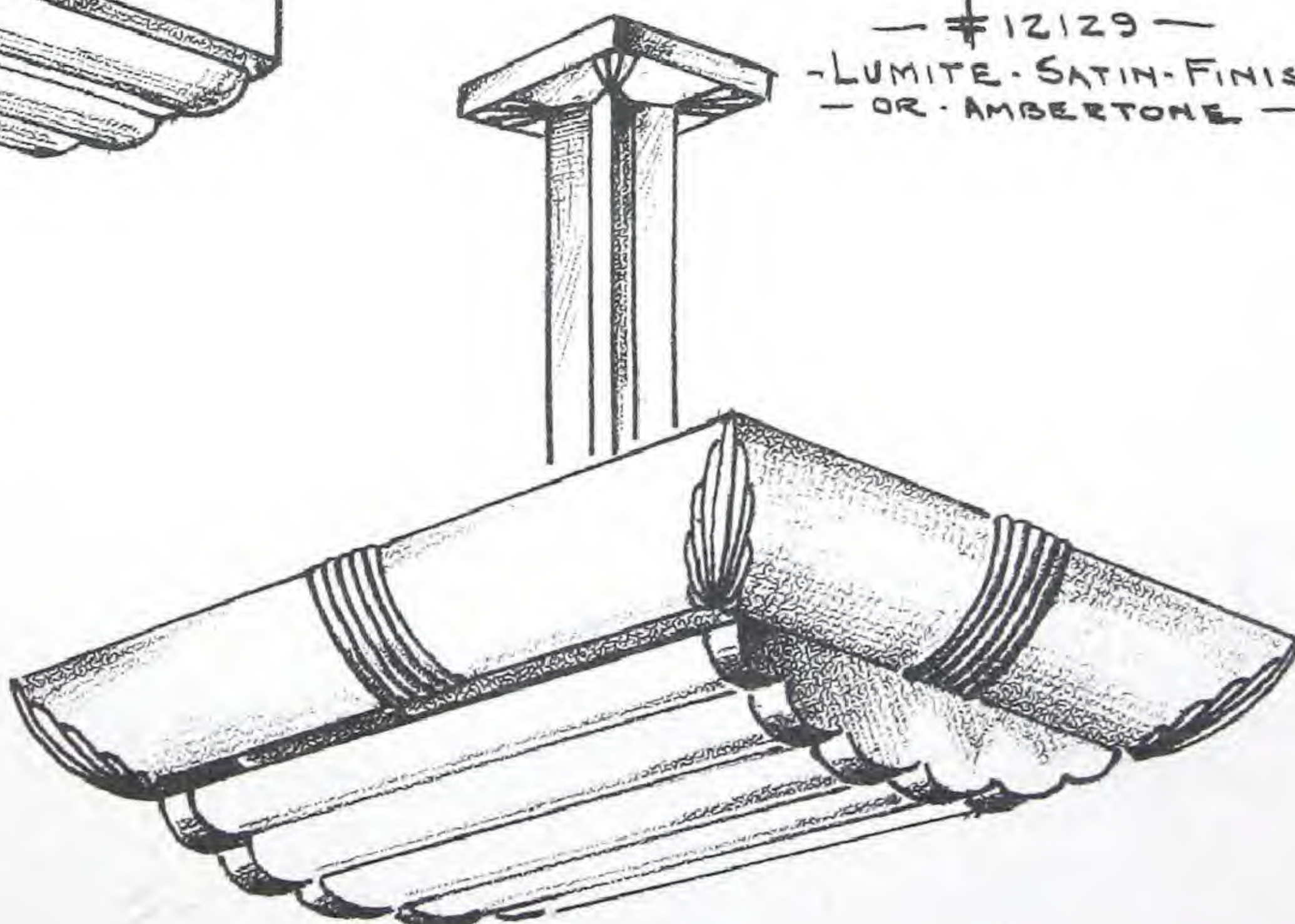


— #12105 —

— LUMITE-SATIN-FINISH —

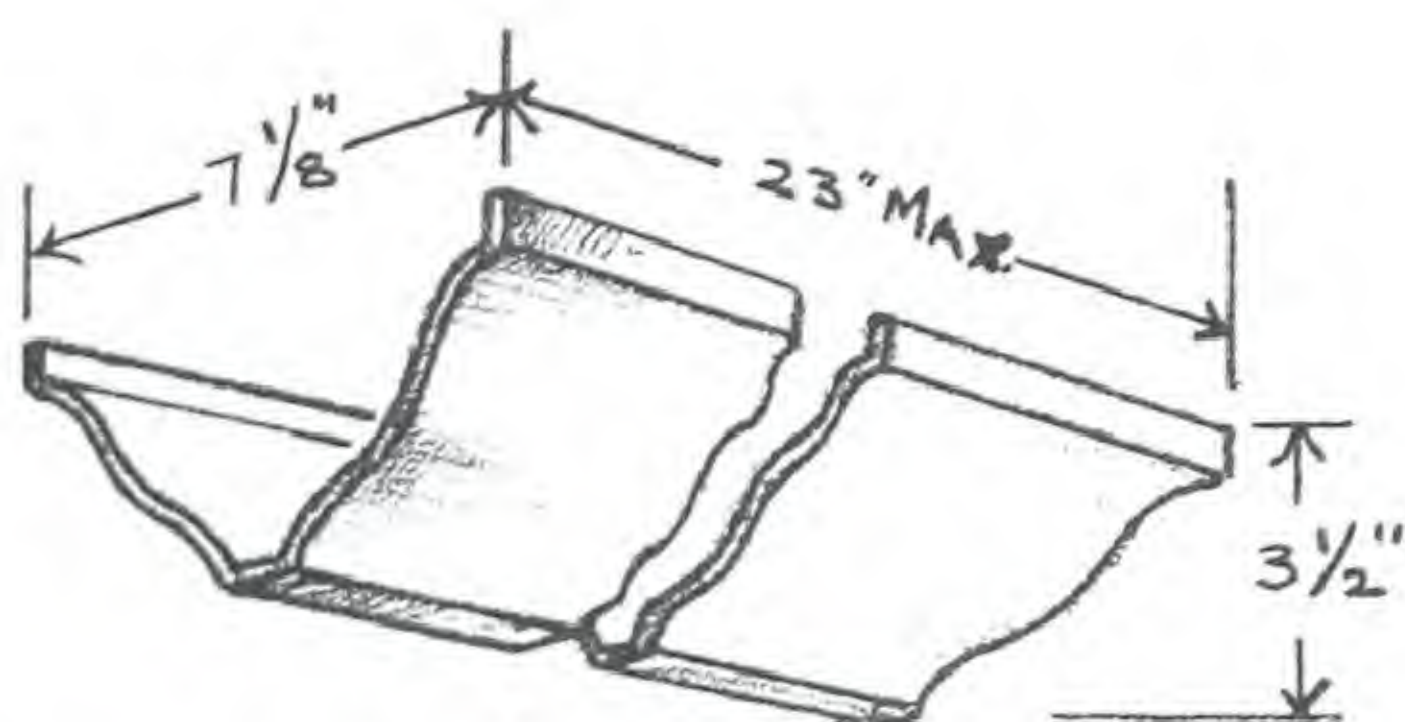
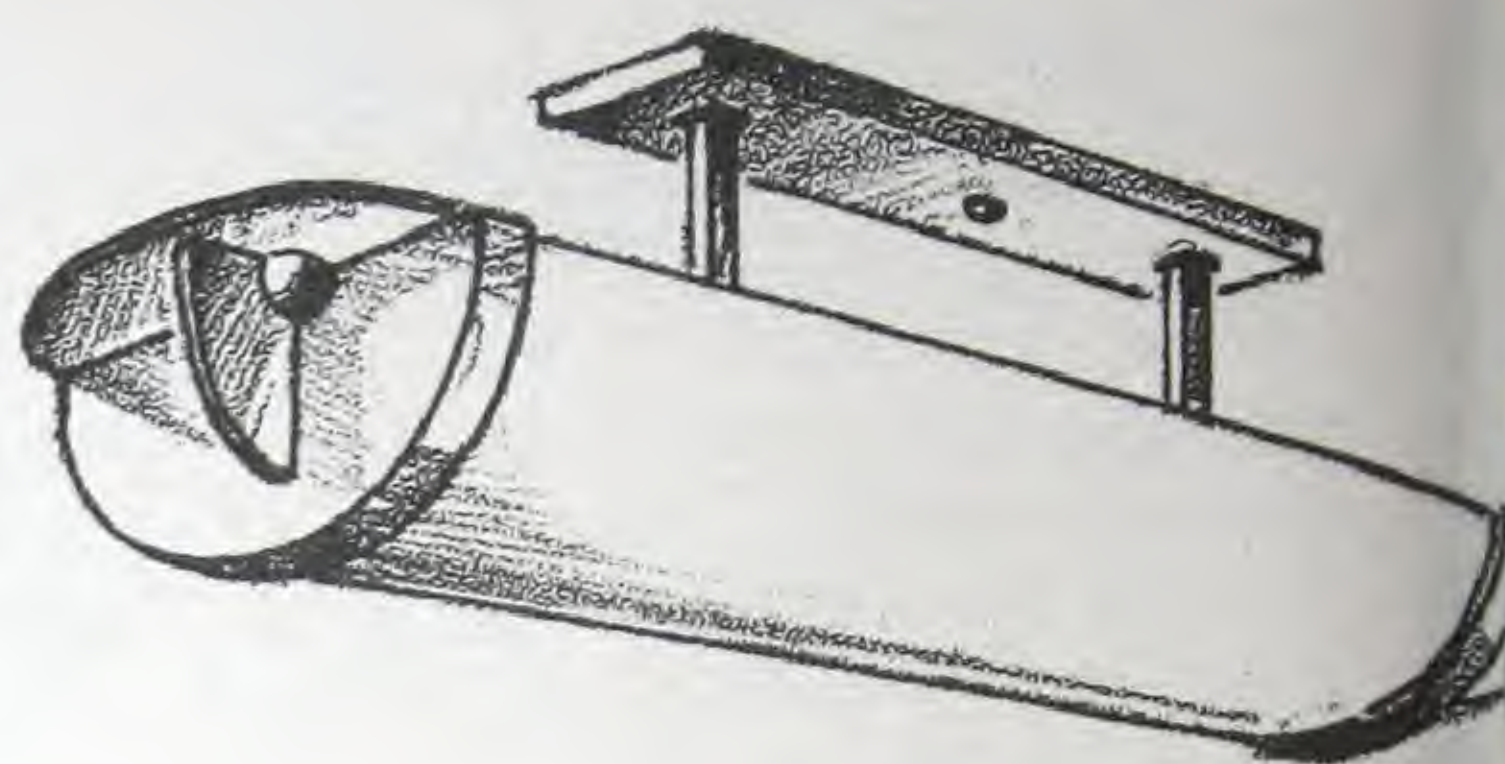
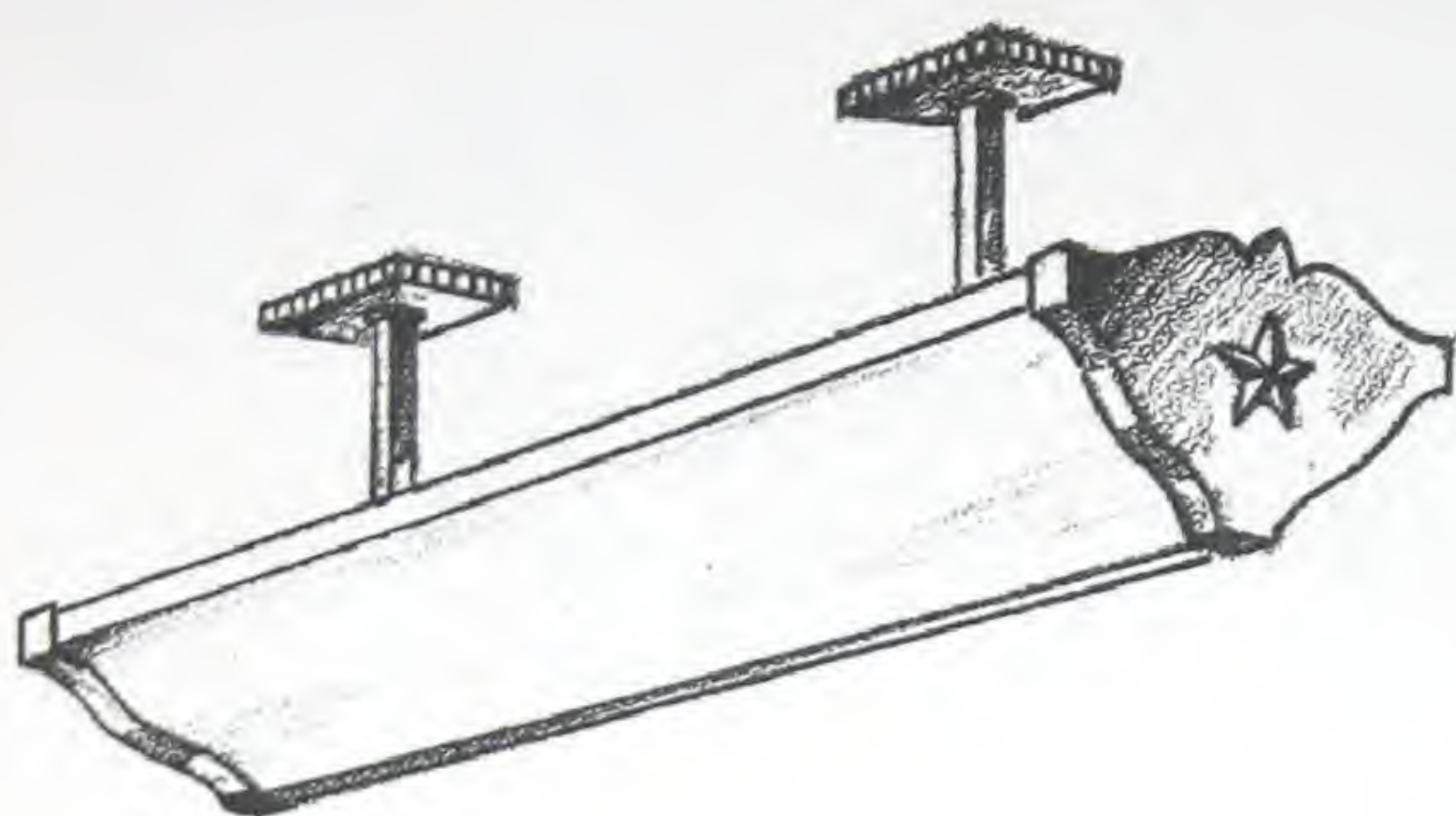


— #12144 —

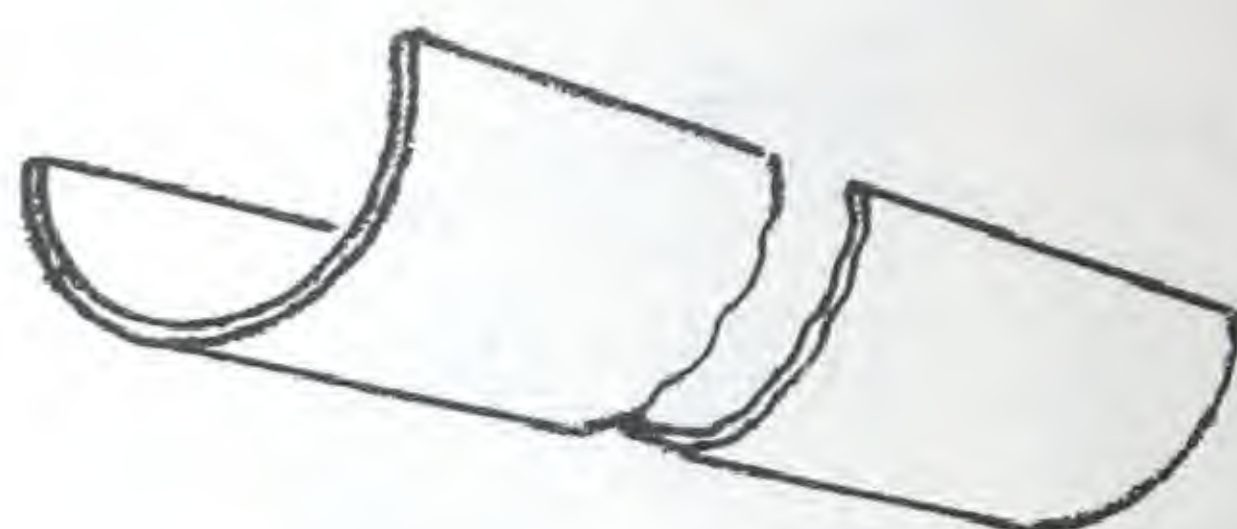


#2056
 — CLEAR-OR —
 — FROSTED — $3\frac{3}{8}$ " DEEP —

— MODERN INTERIORS —
— THE CEILING AS THE SOURCE OF LIGHT —

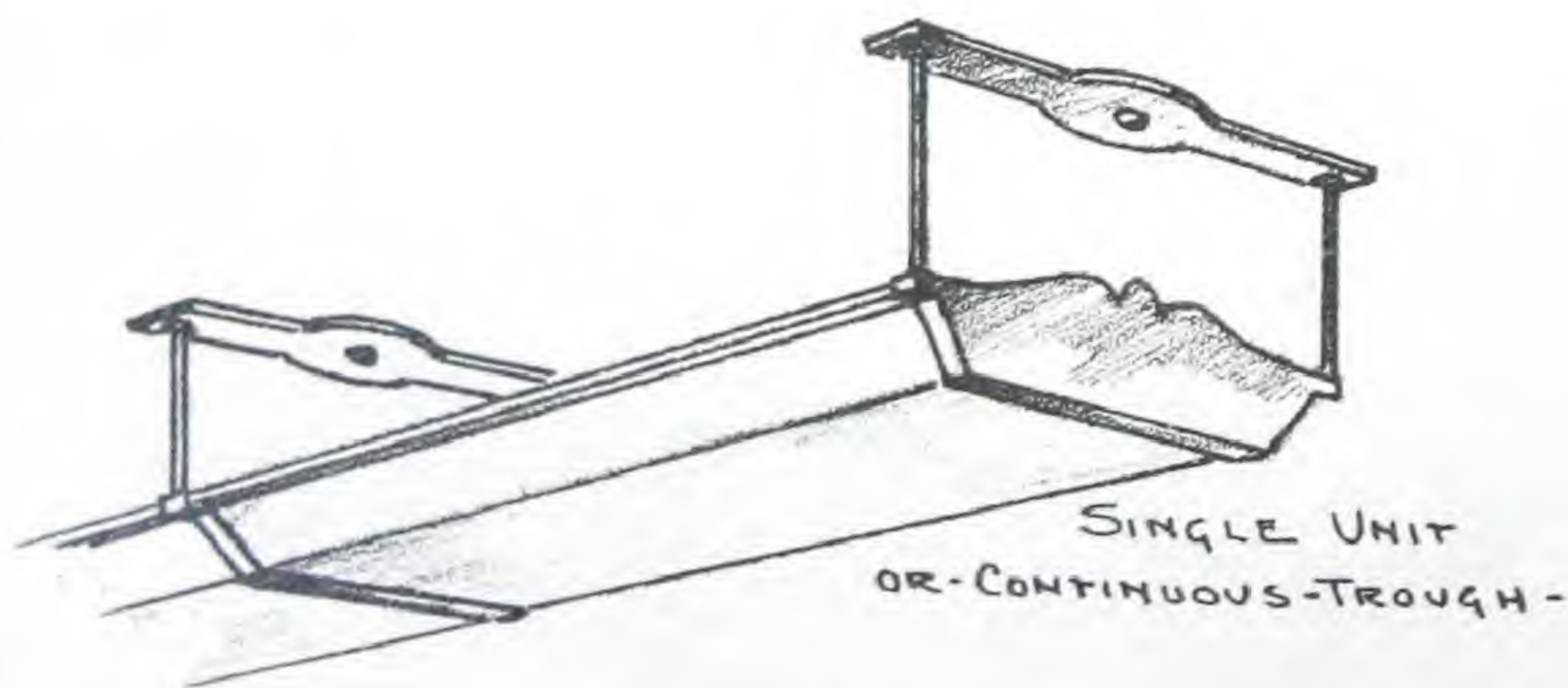


— #12141-H —
— MONAX TROUGH STRIP —

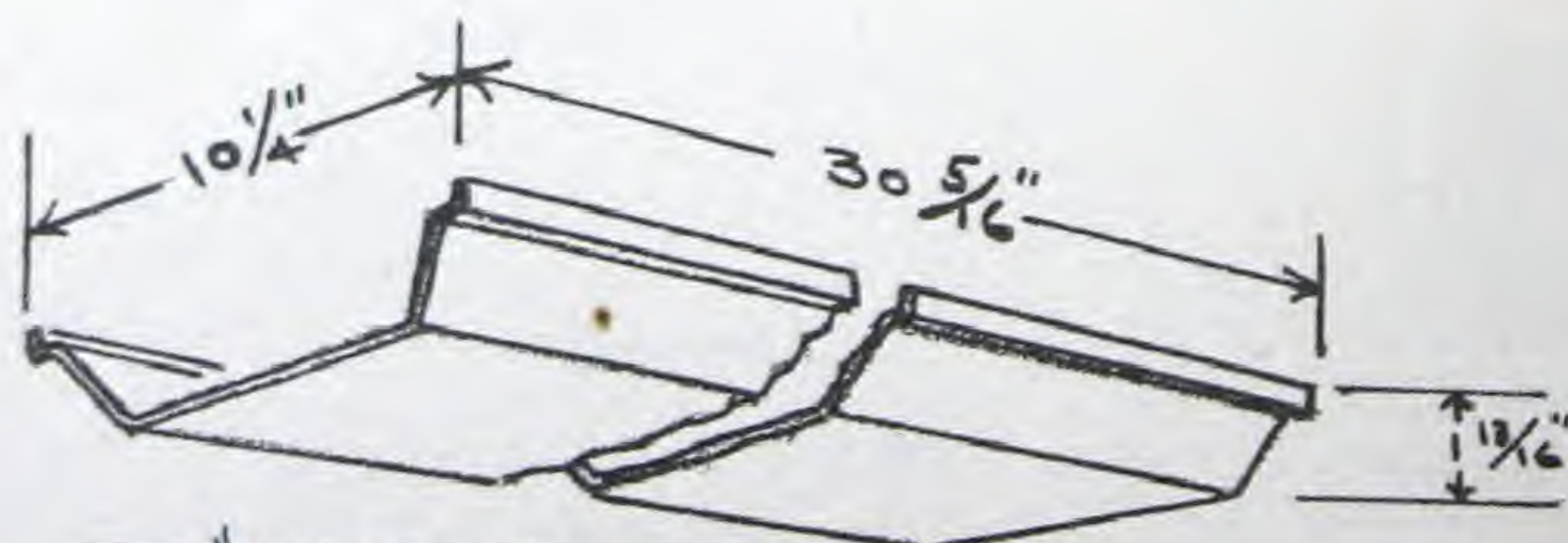


— MONAX HALF-CYLINDERS —

DIA.	MAX. LENGTH
2"	21"
2 1/2"	14"
3"	18"
3 1/2"	14"
4"	19"
4 1/2"	32"
5"	16"
6"	21"
7"	16"
8"	26"
10"	18"
12"	36"
13 5/8"	28"

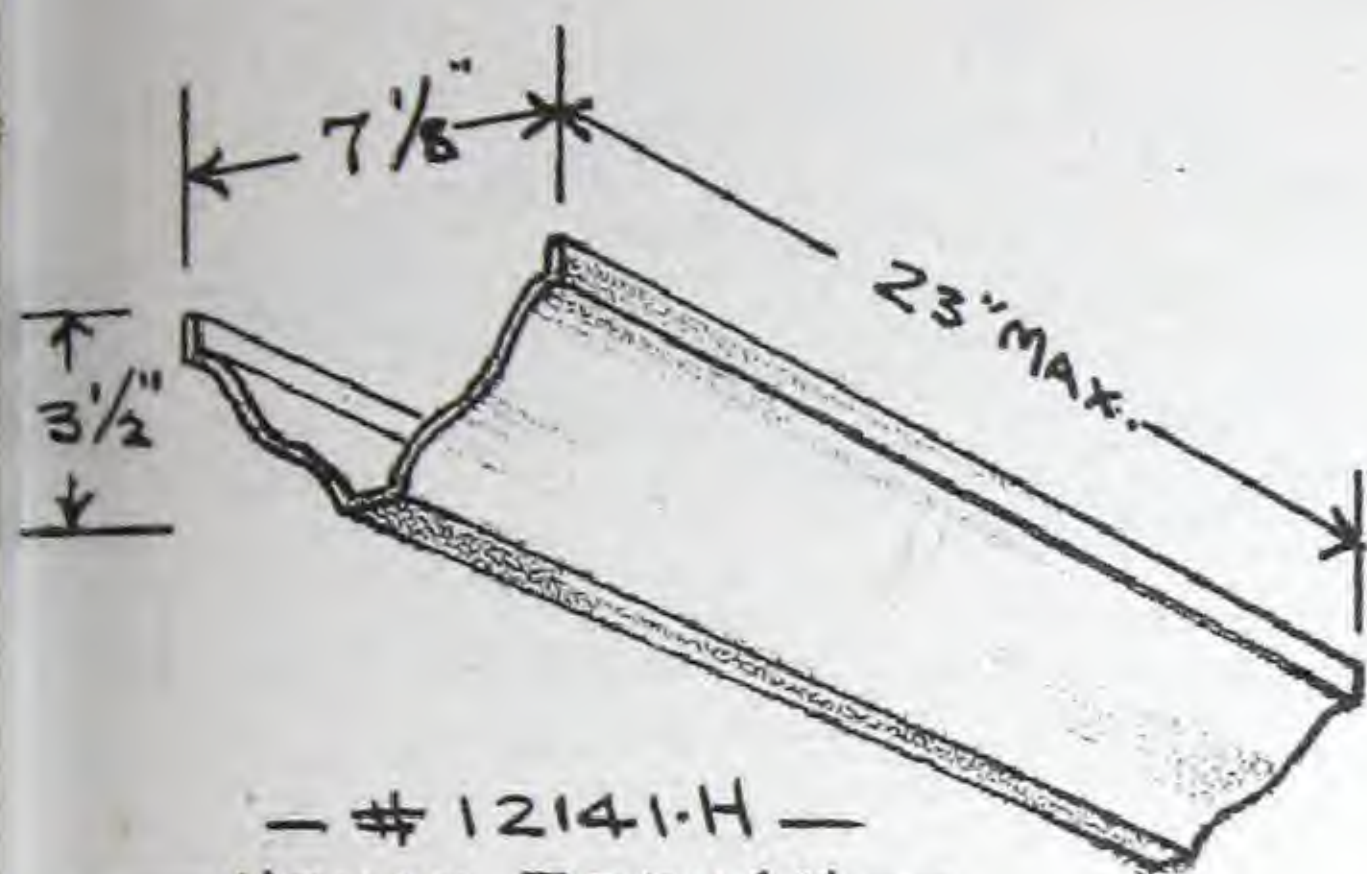


SINGLE UNIT
OR CONTINUOUS TROUGH

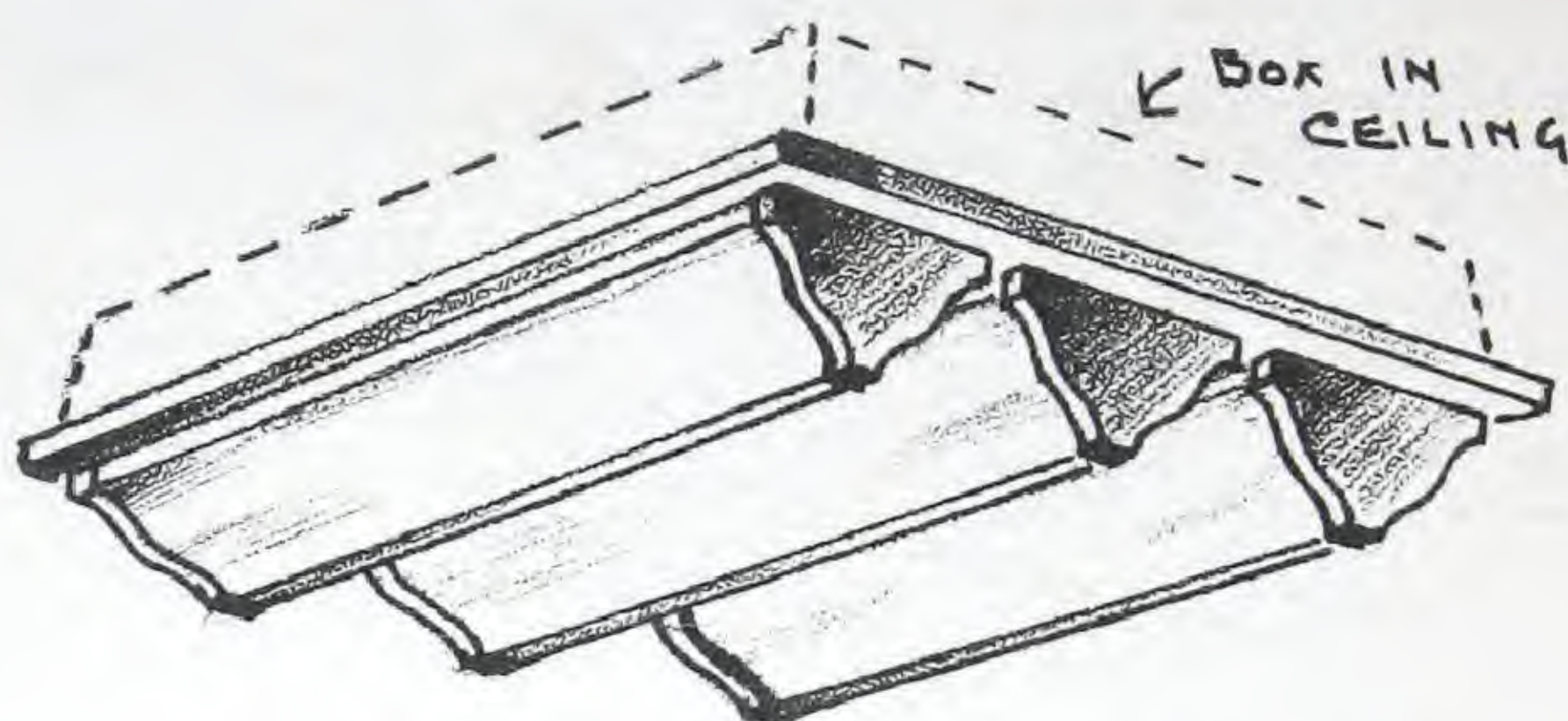


— #12151-MONAX TROUGH STRIP —

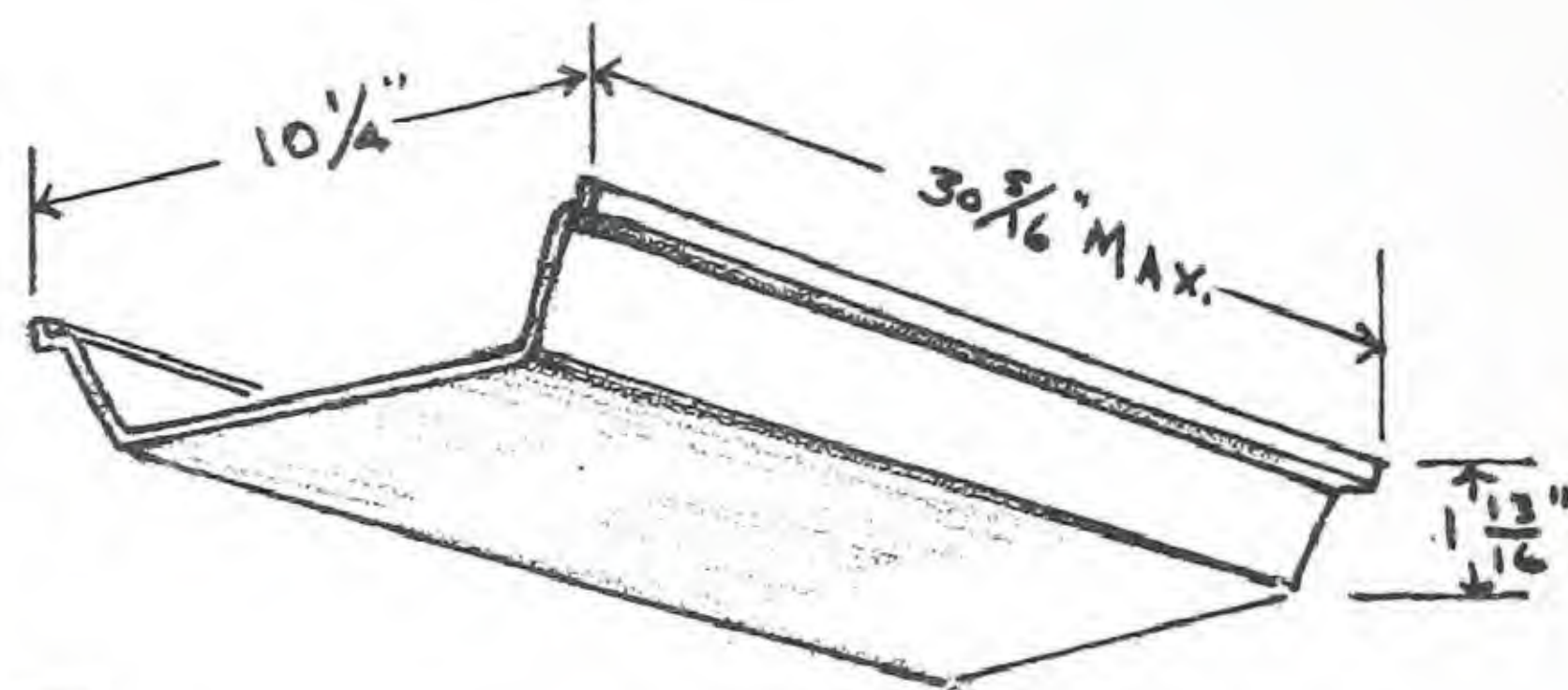
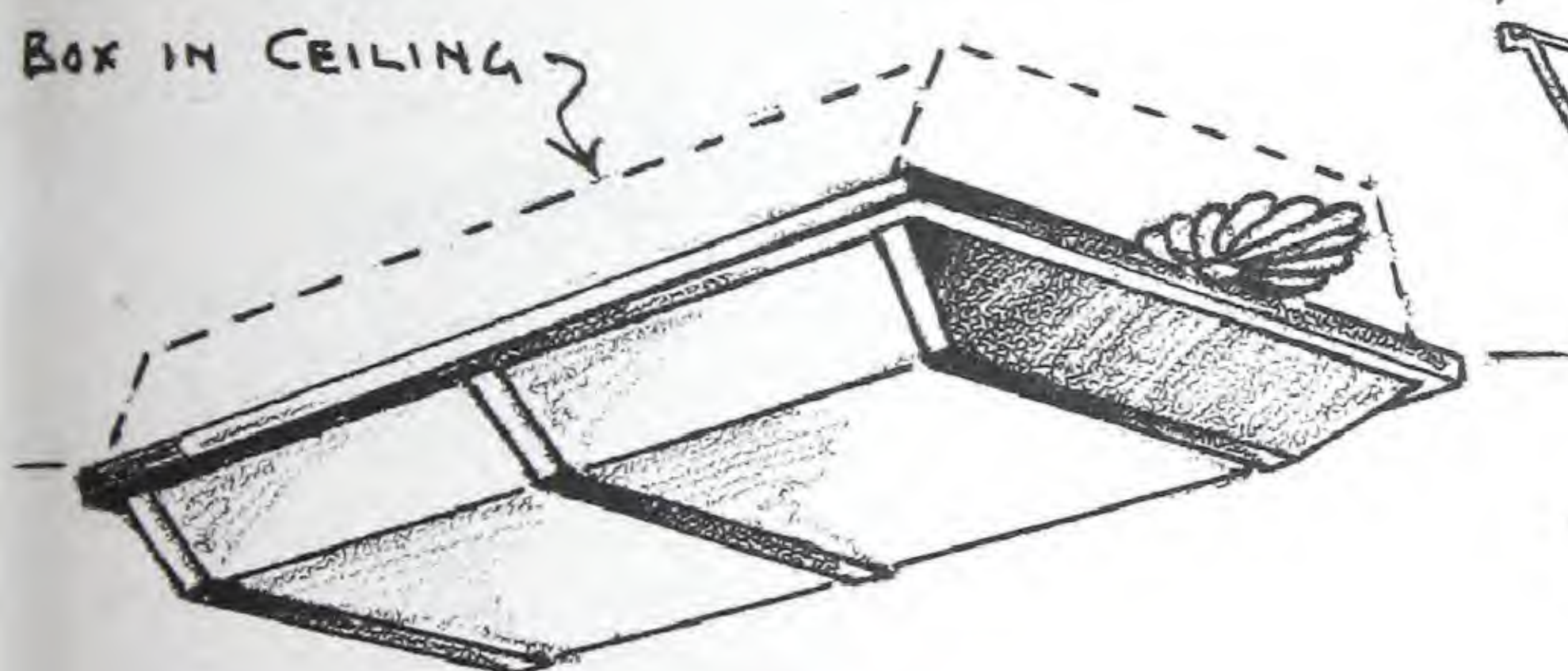
— MODERN INTERIORS —
 — THE CEILING CONTAINS THE SOURCE OF LIGHT —



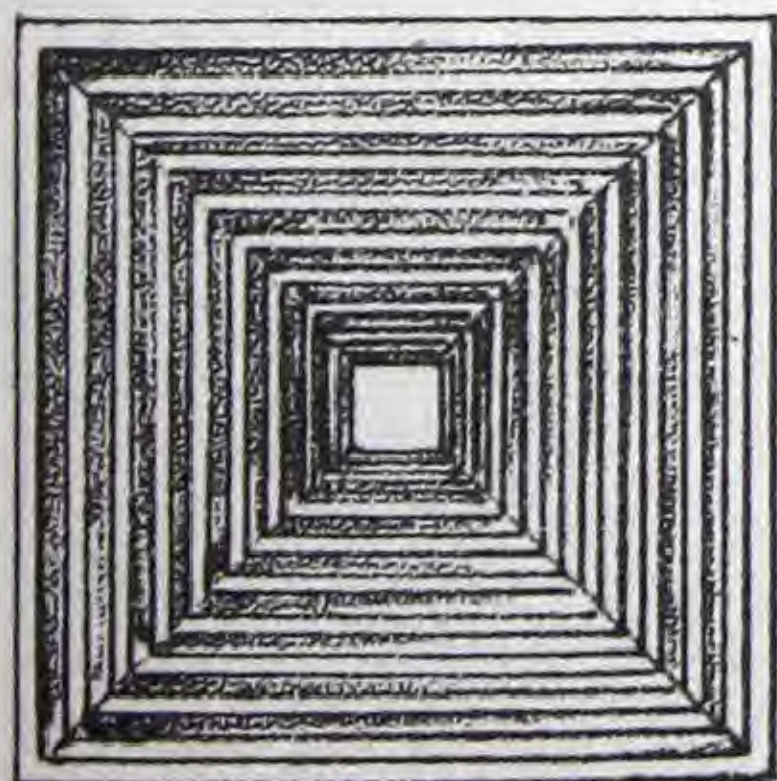
— #12141-H —
 — MONAX TROUGH —
 — STRIP —



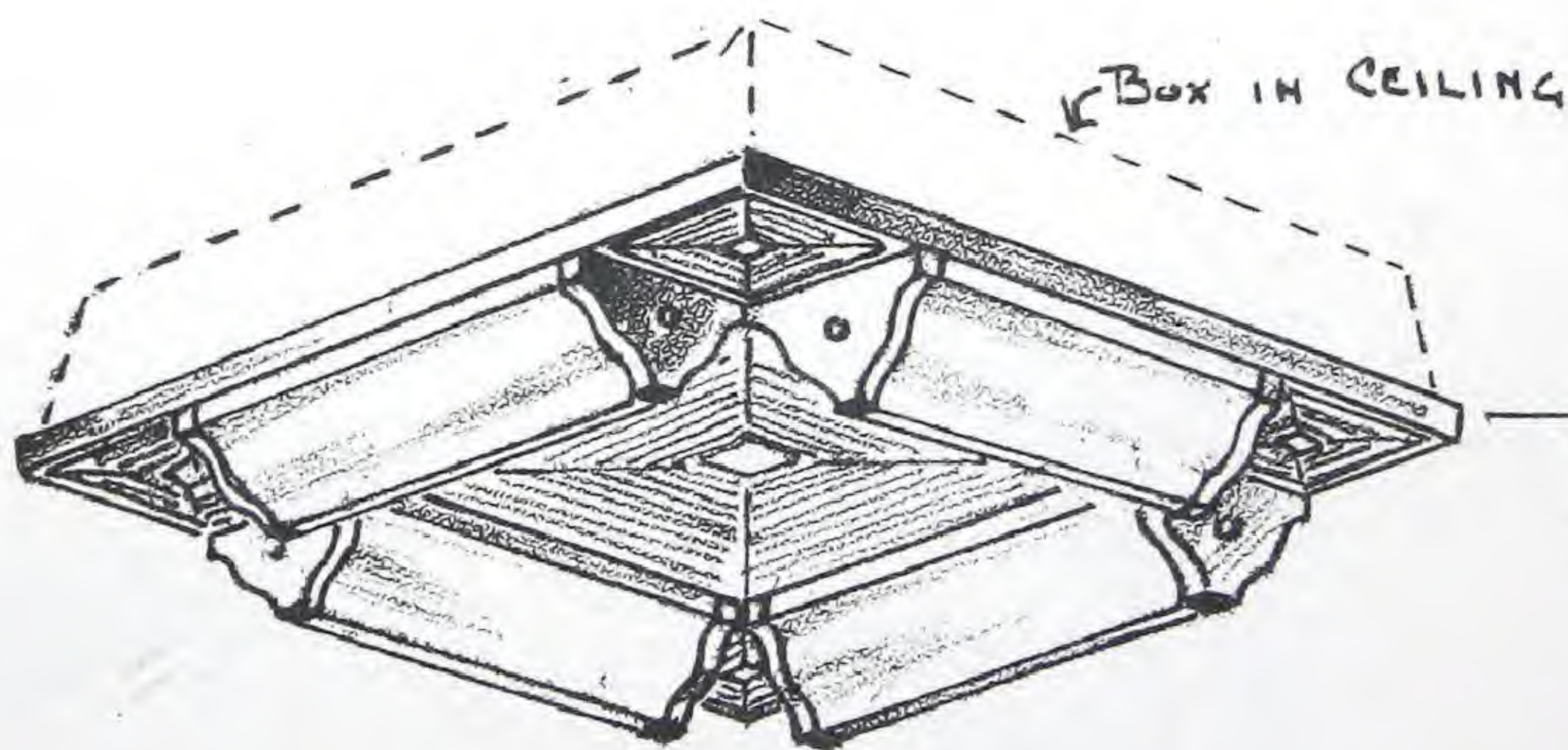
A UNIT OF THREE #12141 H TROUGHS



#12151
 — MONAX TROUGH STRIP —



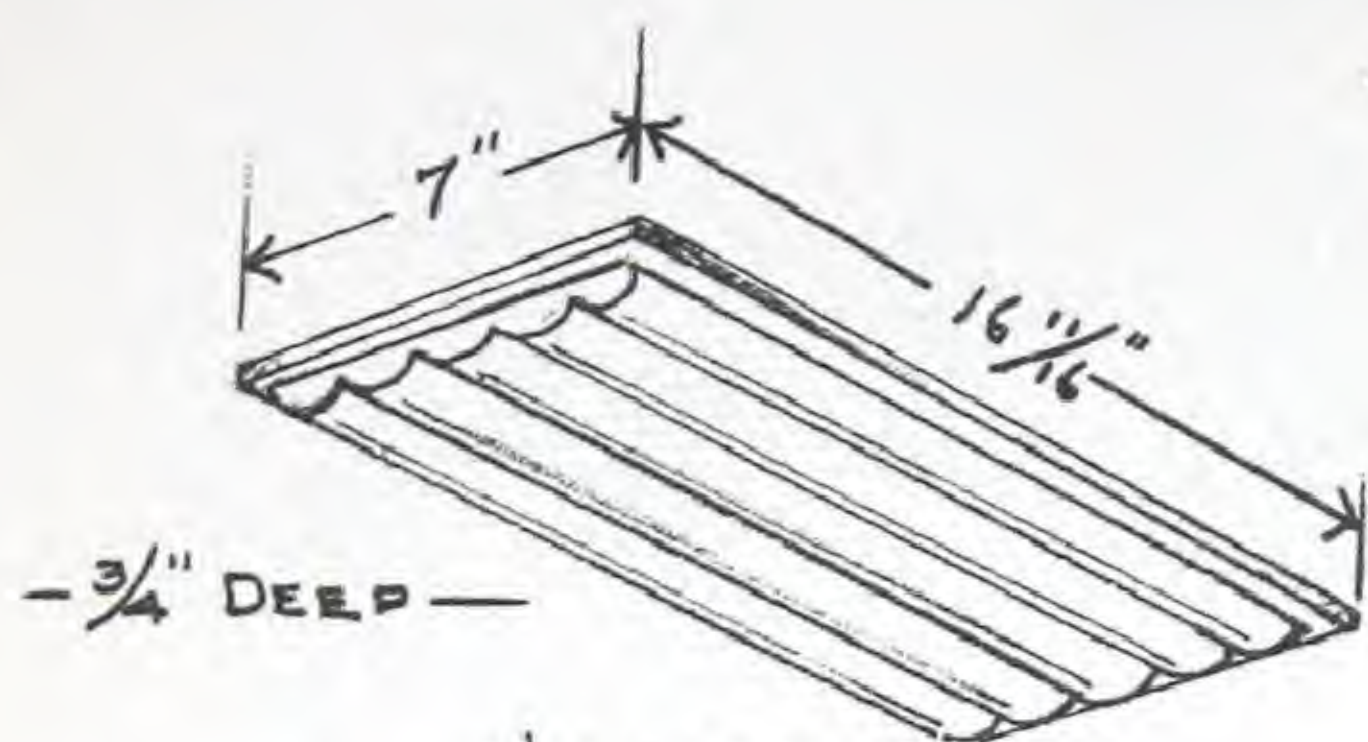
— ALVAX PLATES —
 12109 - 6 1/2" SQ. - 1/4" THICK
 12117 8" SQ. - 1/4" THICK
 12120 12" SQ. - 1/4" THICK



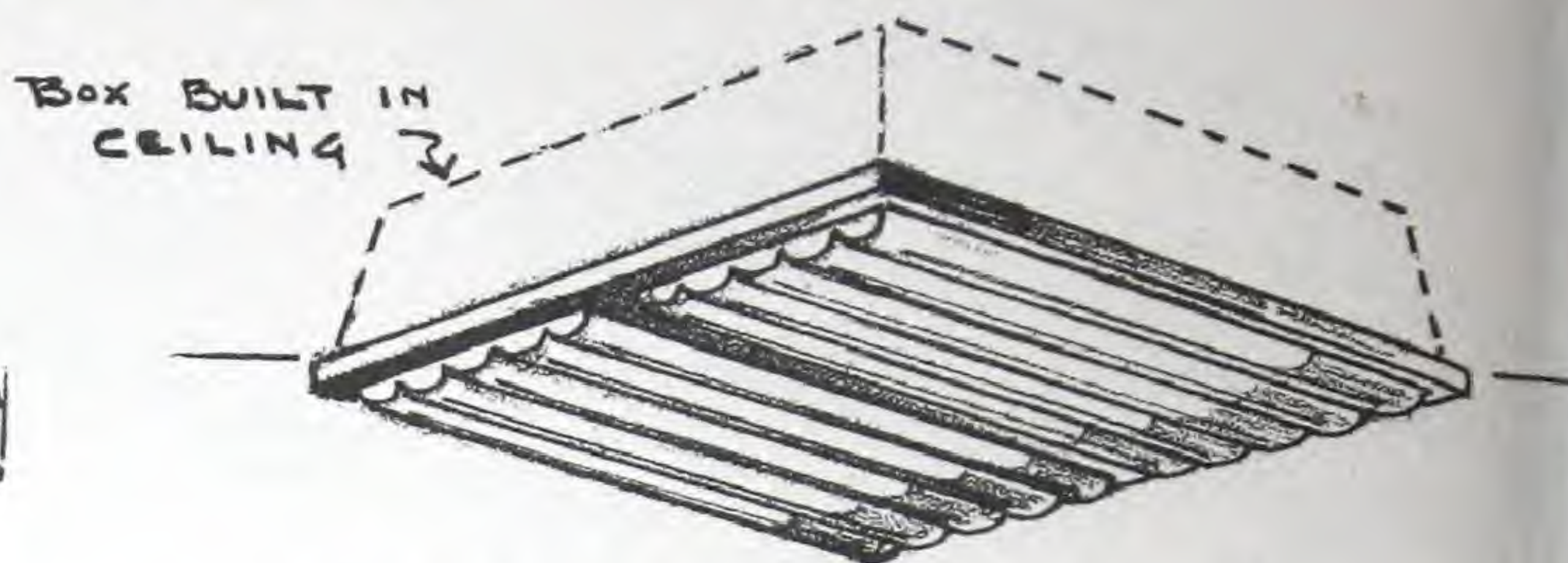
— MONAX TROUGH STRIPS AND ALVAX —
 — PLATES MAKE A PLEASING COMBINATION —

MODERN INTERIORS

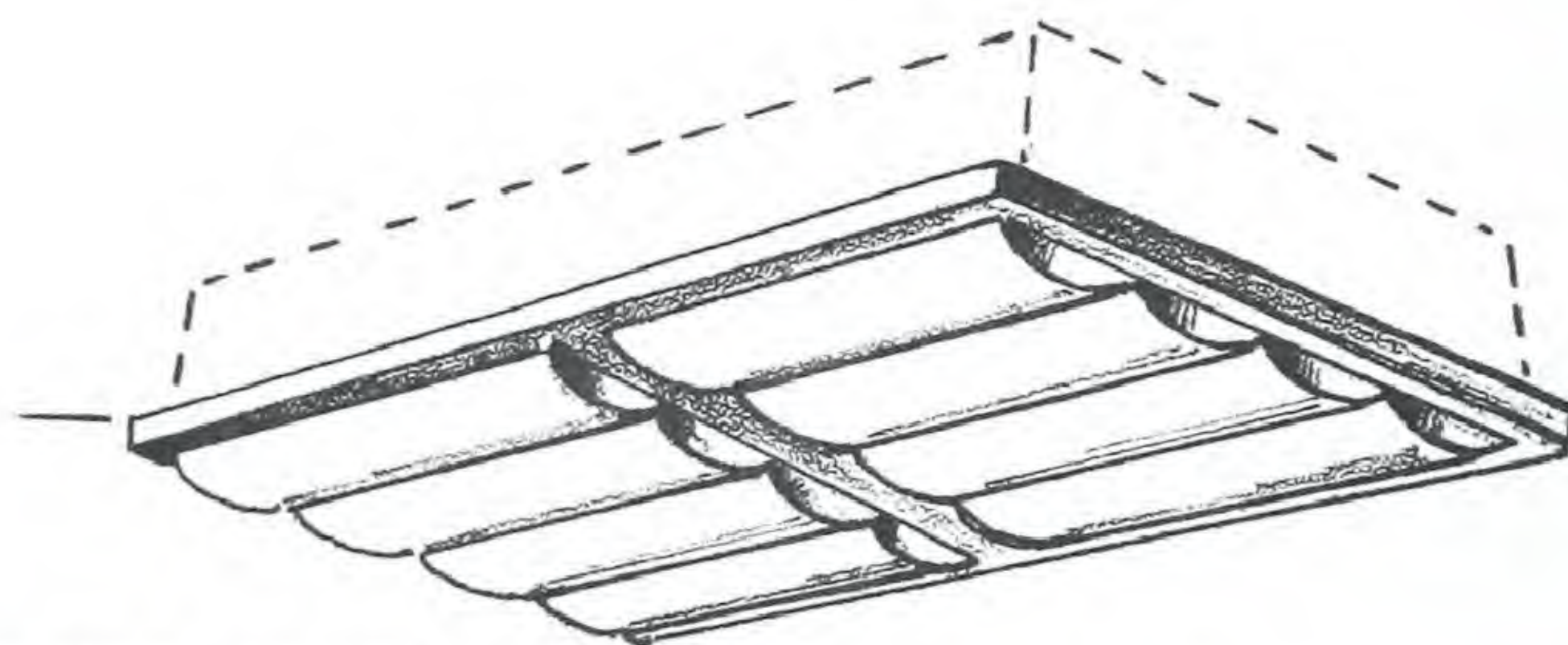
— THE - CEILING - CONTAINS - THE - SOURCE - OF - LIGHT -



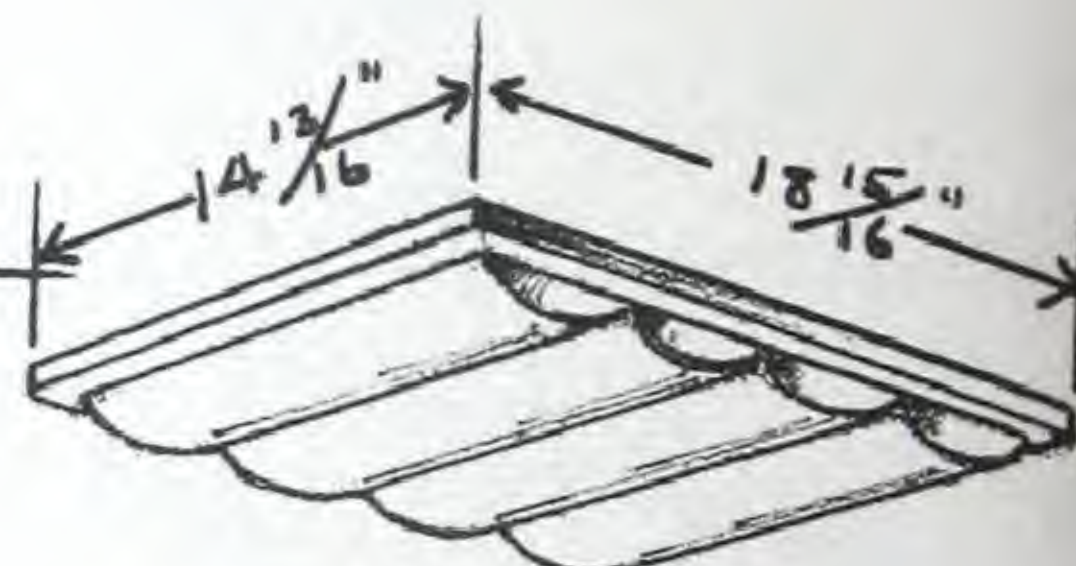
#12128
— LUMITE - SATIN - OR —
— LUMITE AMBERTONE —



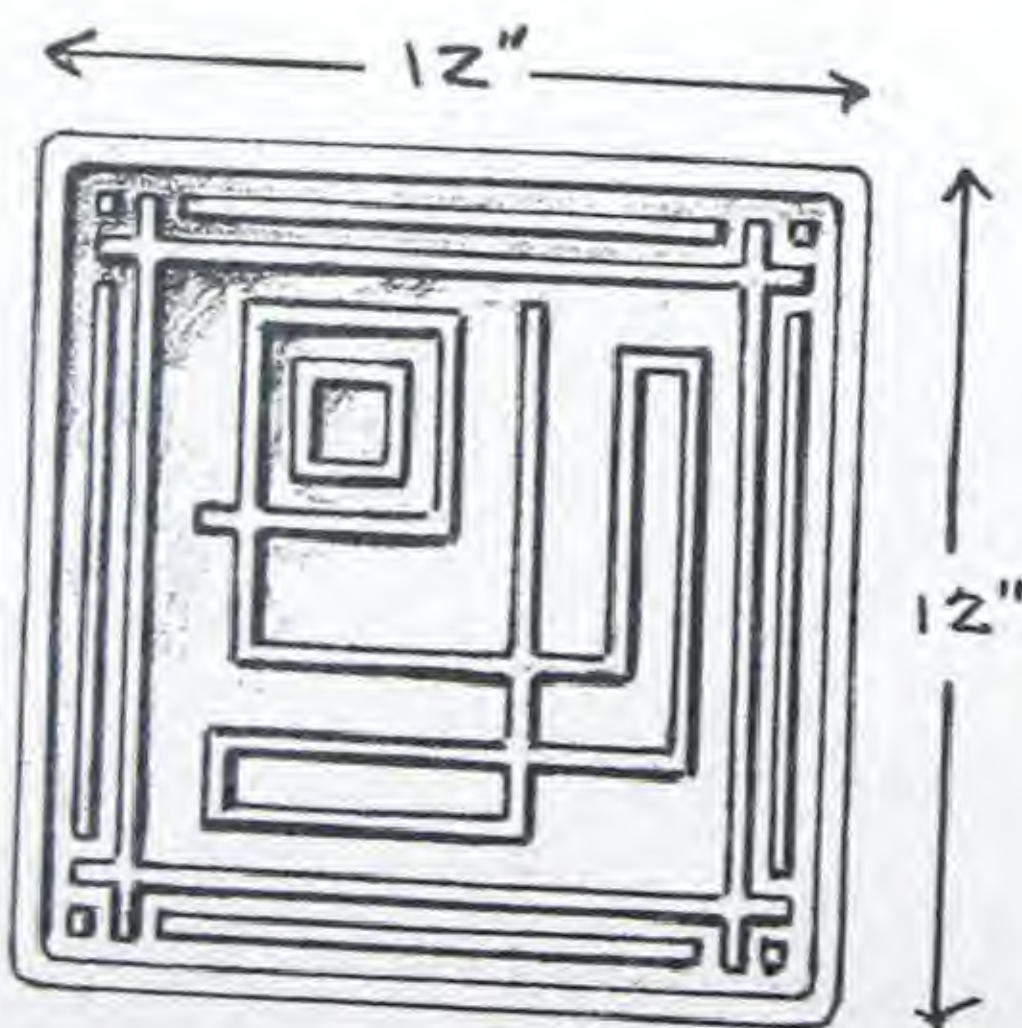
— TWO - #12128 - USED - TO - FORM - A - FLUSH -
— TYPE - CEILING - FIXTURE —



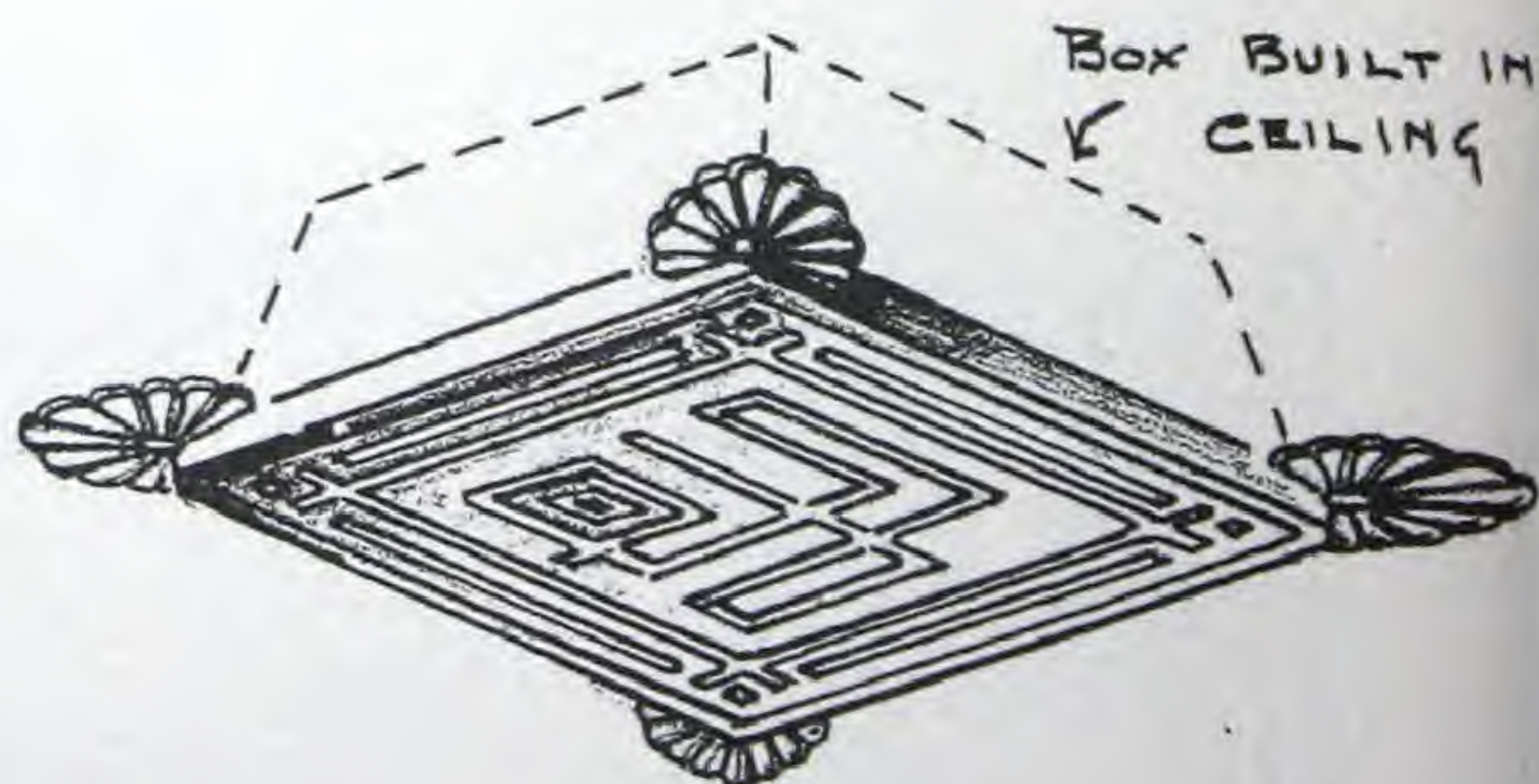
— ONE - OR - MORE - #12149 - PANELS - CAN —
— BE - USED - TO - FORM - FLUSH - TYPE - LIGHTING —
— UNITS —



#12149
— LUMITE - SATIN - OR —
— LUMITE - AMBERTONE —
— 1 1/16" - DEEP —



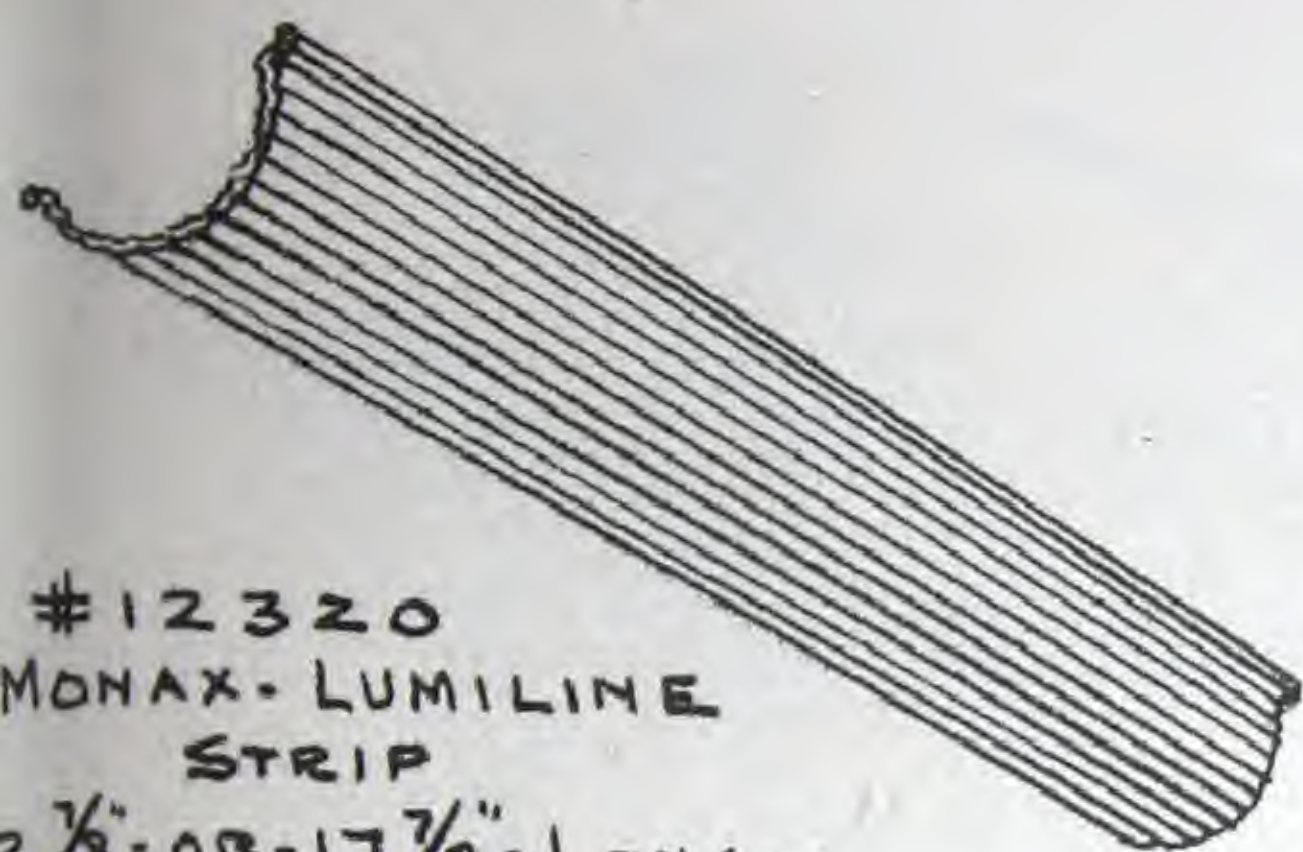
#12349 ALYAX
— 1/4" - THICK —



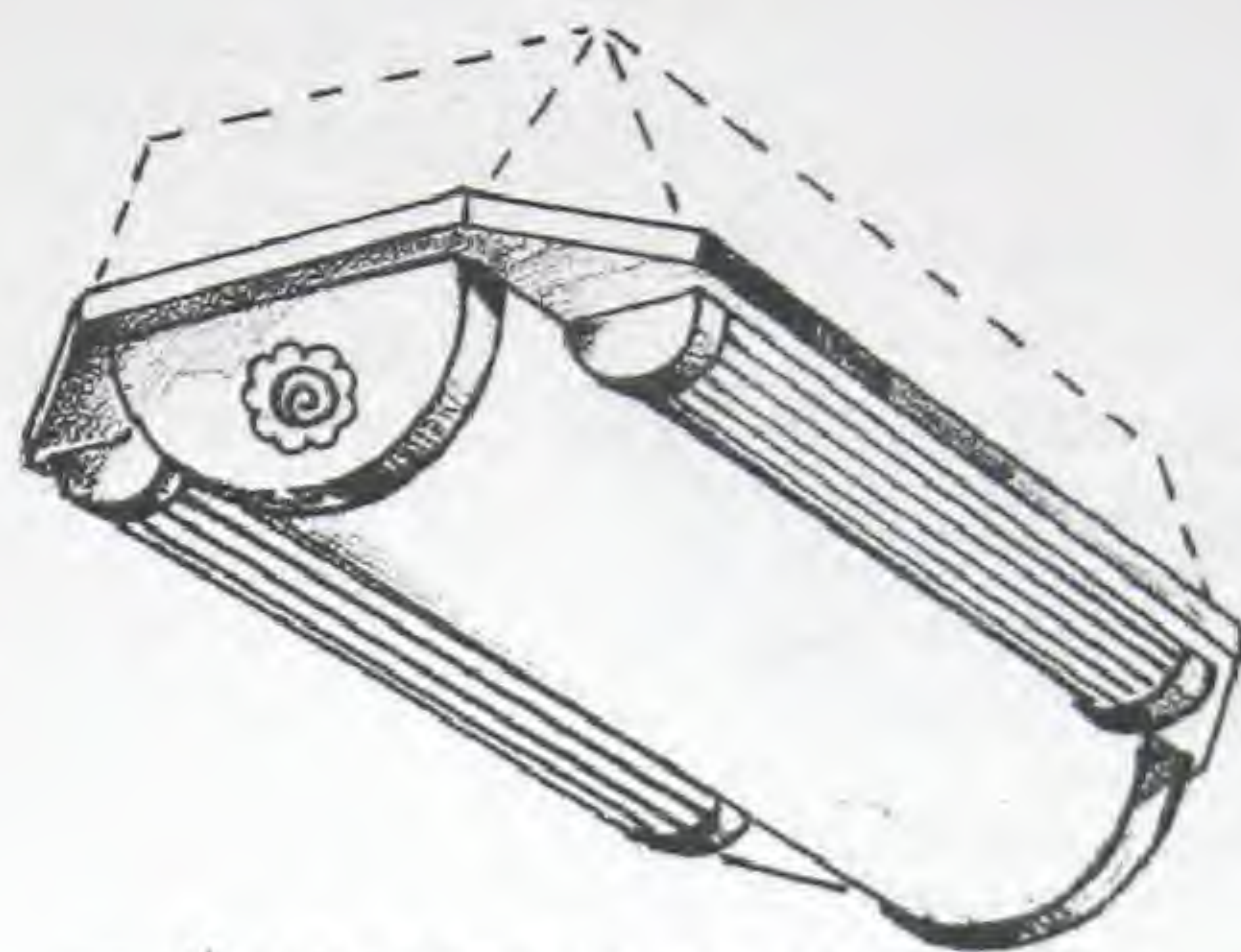
Box BUILT IN
CEILING

— MODERN INTERIORS —

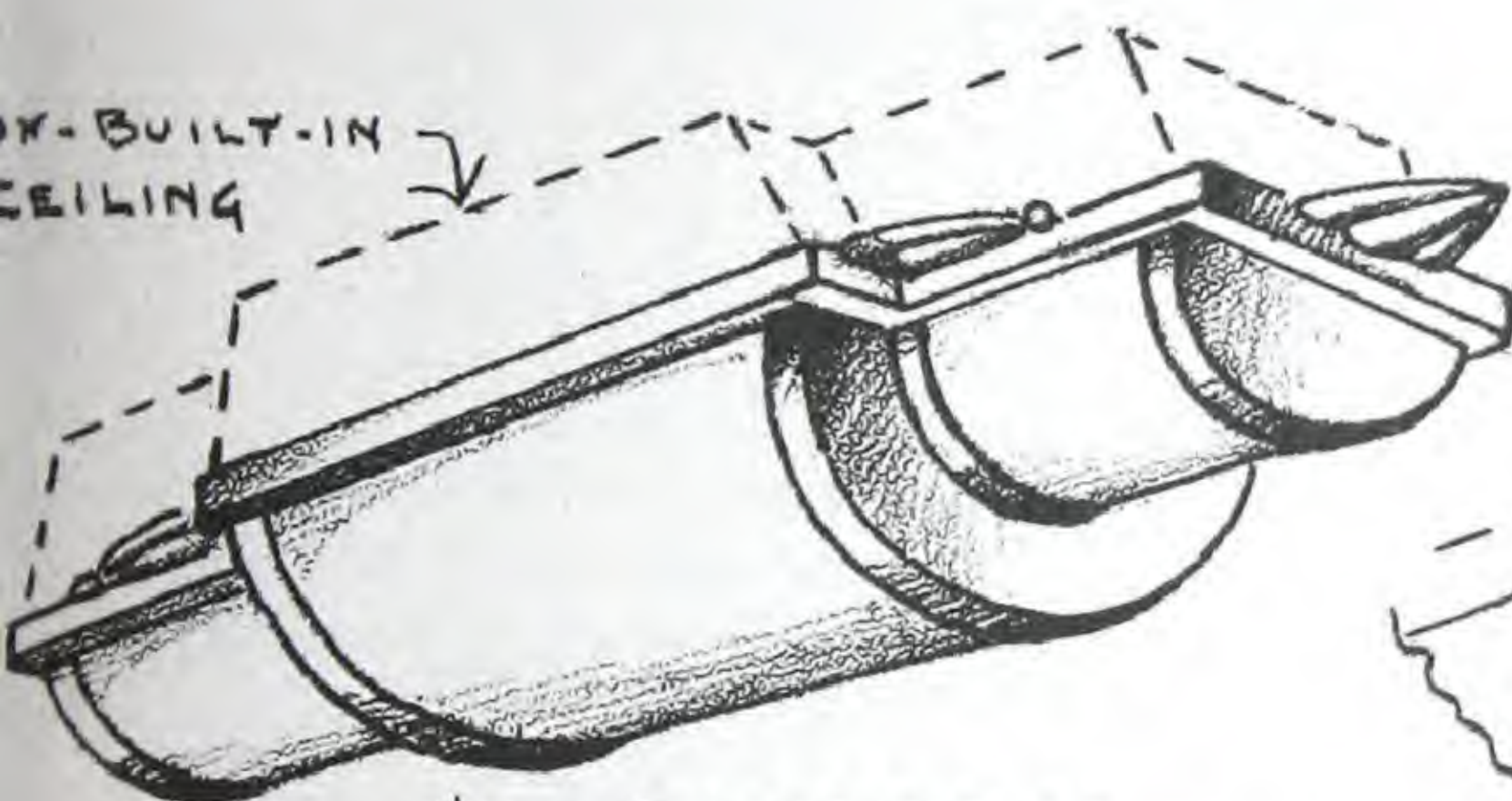
— THE - CEILING - CONTAINS - THE - SOURCE - OF - LIGHT —



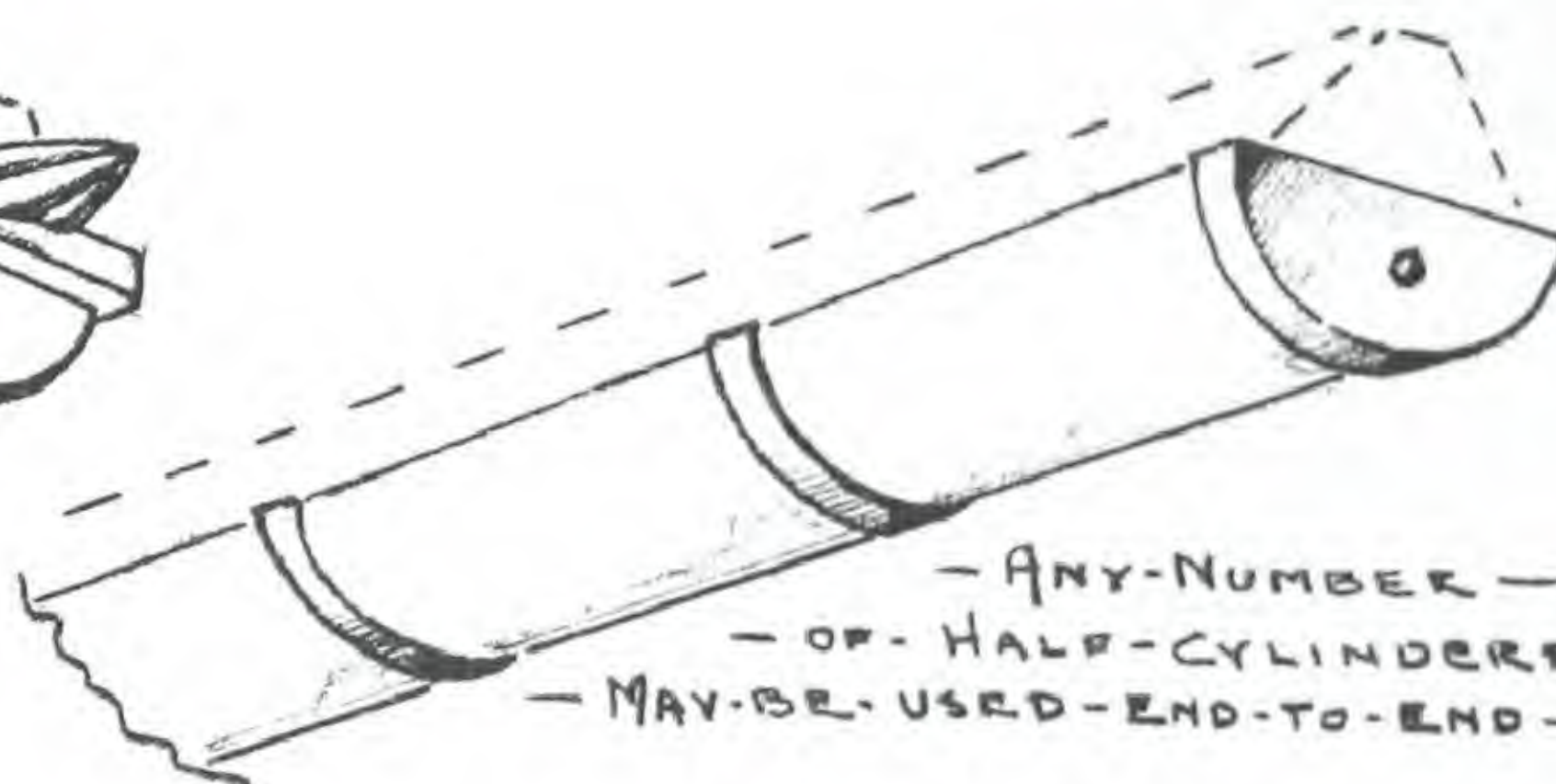
#12320
MONAX - LUMILINE
STRIP
2 7/8" OR 17 7/8" LONG -
- 2 7/8" WIDE -
- 1 1/2" DEEP -



— #12320 FLUTED STRIP —
— MAY BE COMBINED WITH PLAIN —
— HALF CYLINDERS —



— HALF CYLINDERS OF —
— DIFFERENT SIZES MAY BE —
— COMBINED —

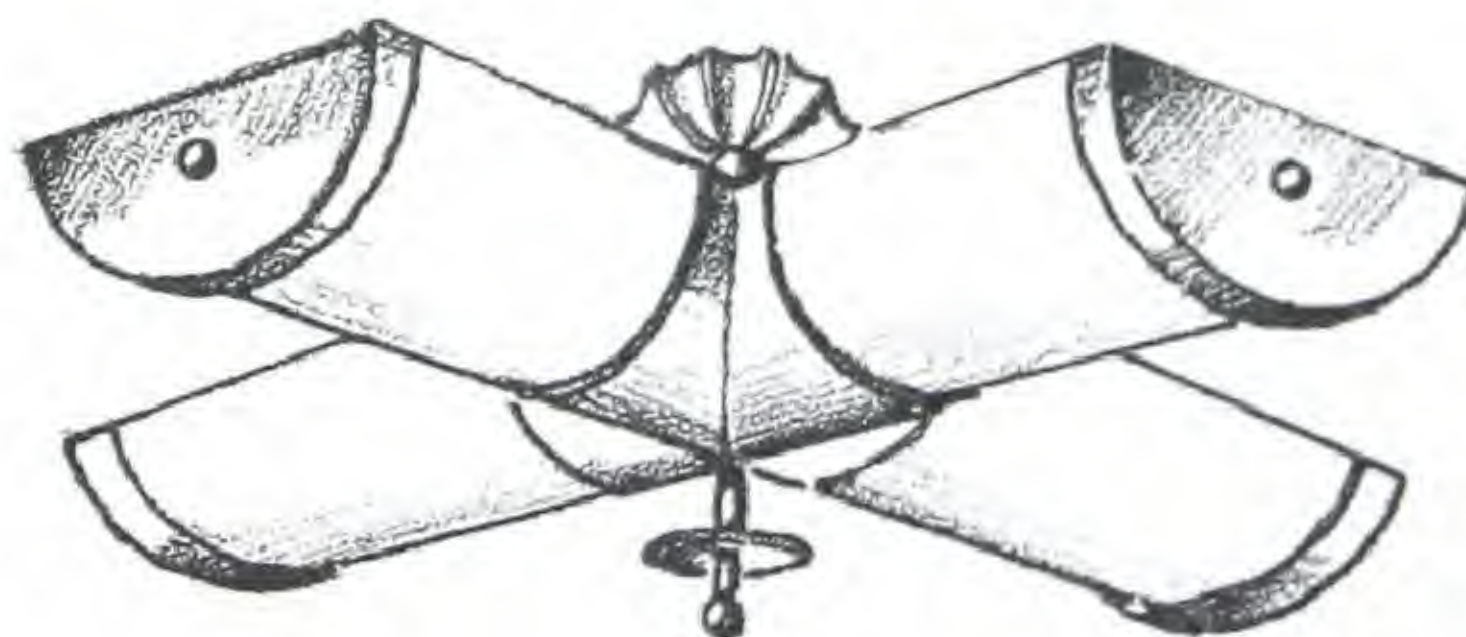


— ANY NUMBER —
— OF HALF CYLINDERS —
— MAY BE USED END TO END —



MONAX HALF CYLINDERS

— DIA. —	— MAX. LENGTH —
2"	21"
2 1/2"	14"
3"	18"
3 1/2"	14"
4"	19"
4 1/2"	32"
5"	16"
6"	21"
7"	16"
8"	26"
10"	18"
12"	36"
13 5/8"	28"



— 4 MONAX HALF CYLINDERS —
— COMBINED TO FORM AN INTERESTING —
— CEILING FIXTURE —

— MODERN INTERIORS —

— THE CEILING CONTAINS THE SOURCE OF LIGHT —

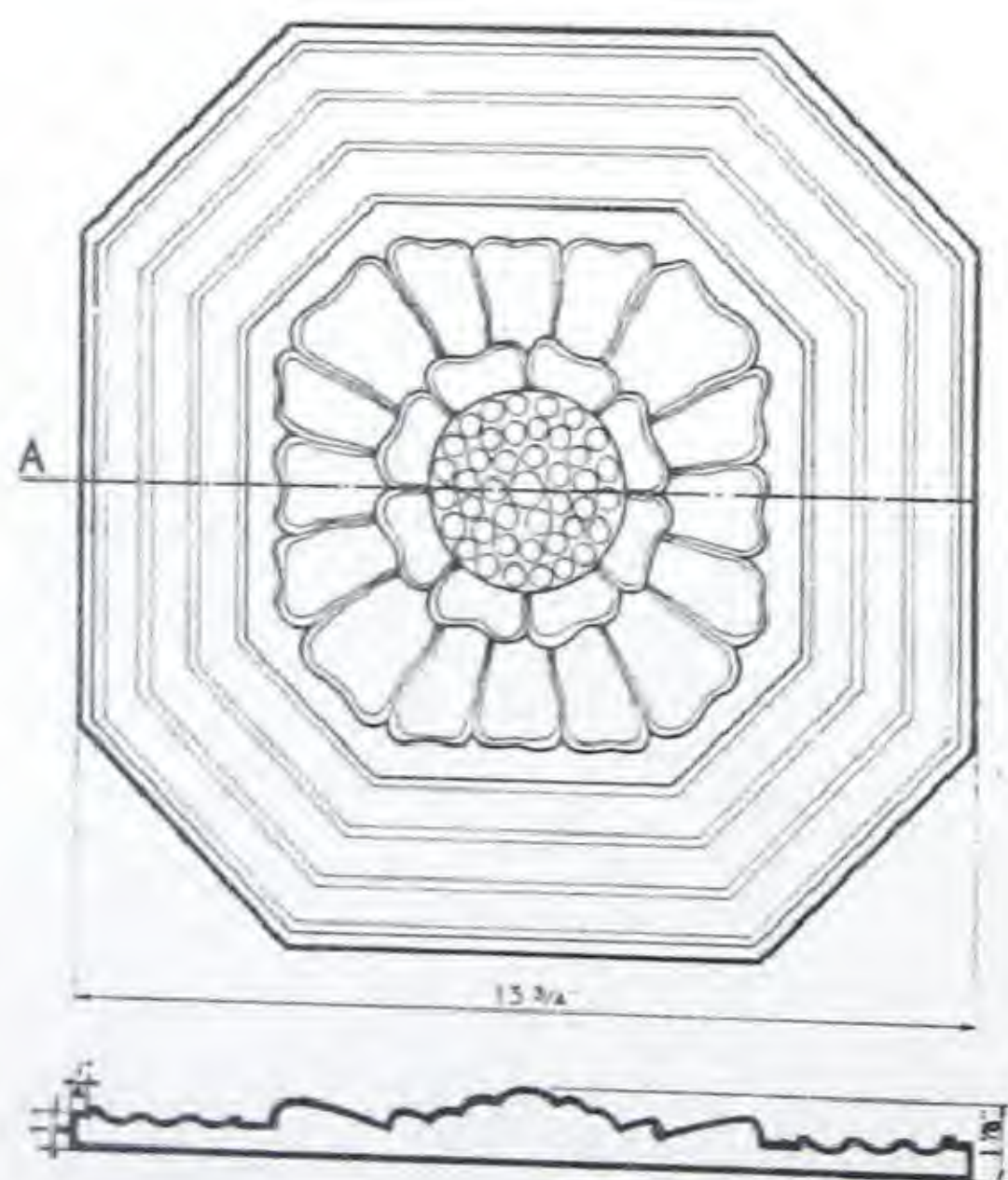
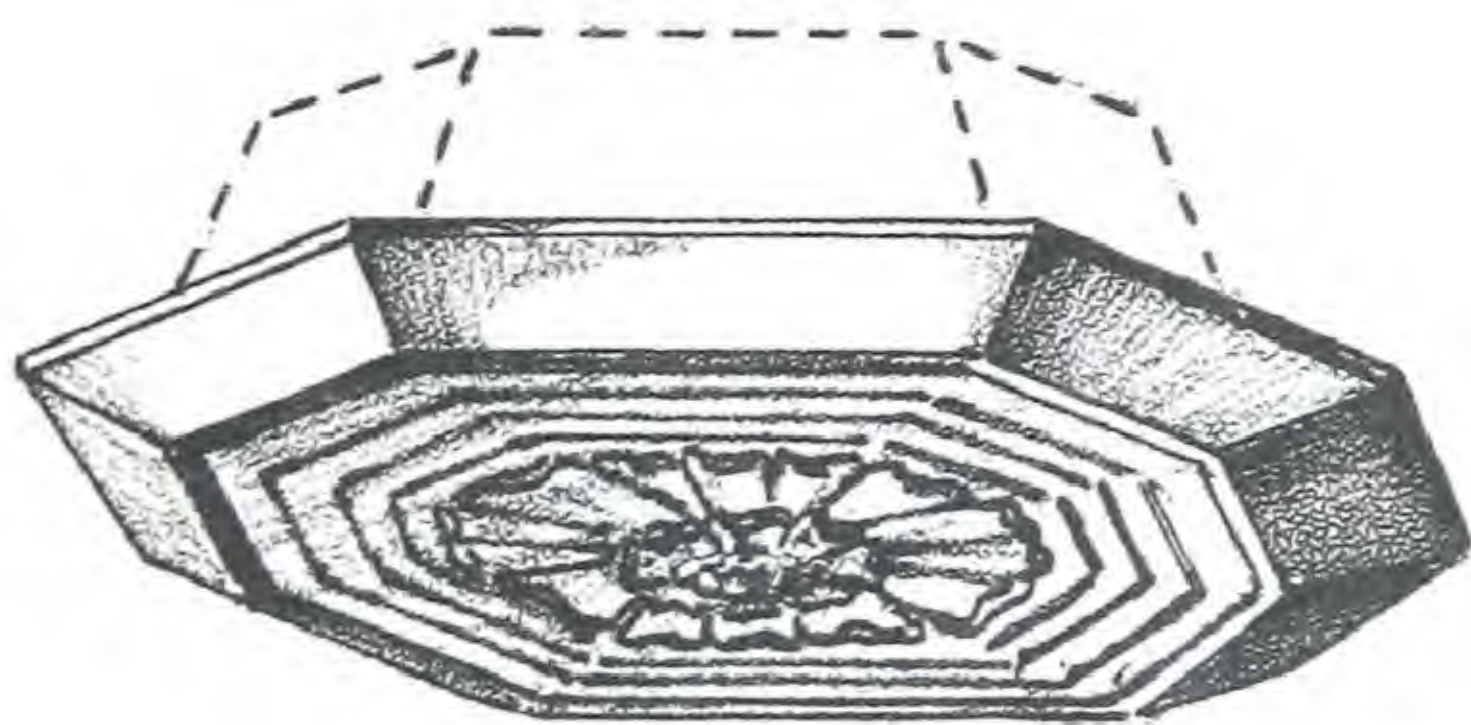


— LUMITE SQUARE GLASS BOWL —
— SATIN FINISH DESIGN DEEPLY —
— ETCHED —

— #12142 - EST 10 $\frac{3}{4}$ " Sq 3 $\frac{3}{4}$ " DEEP —
— #12143 - EST 12 $\frac{3}{4}$ " Sq 4 $\frac{1}{2}$ " DEEP —



— FOR LOW CEILINGS —



SECTION ON A

#2009

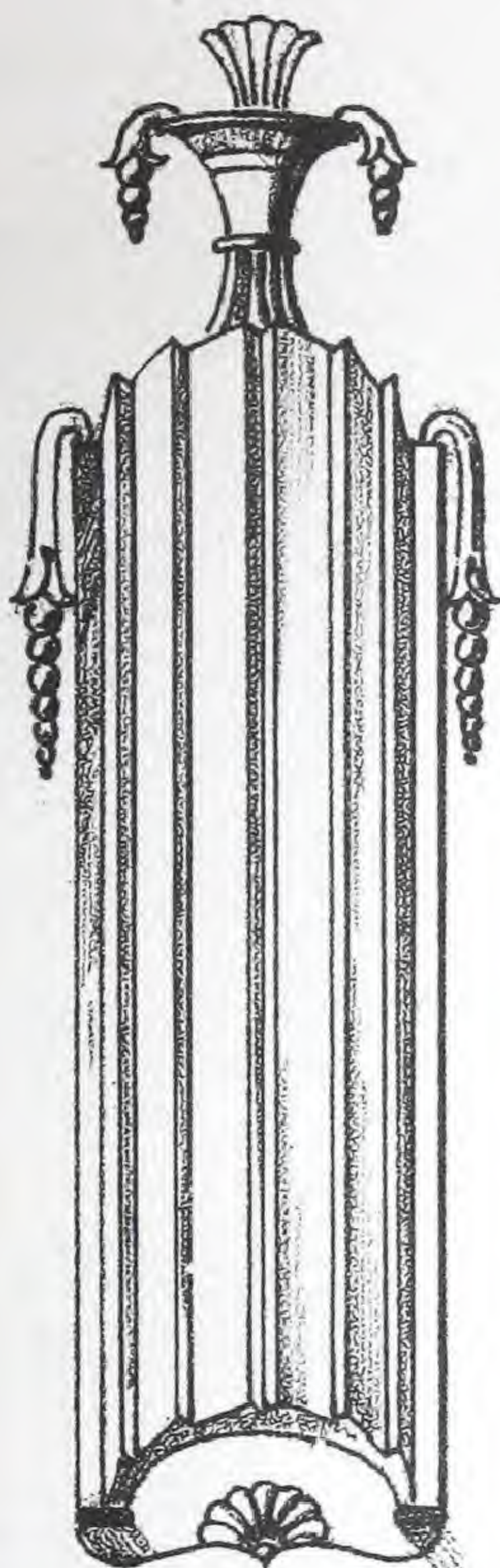
— CLEAR OR FROSTED —



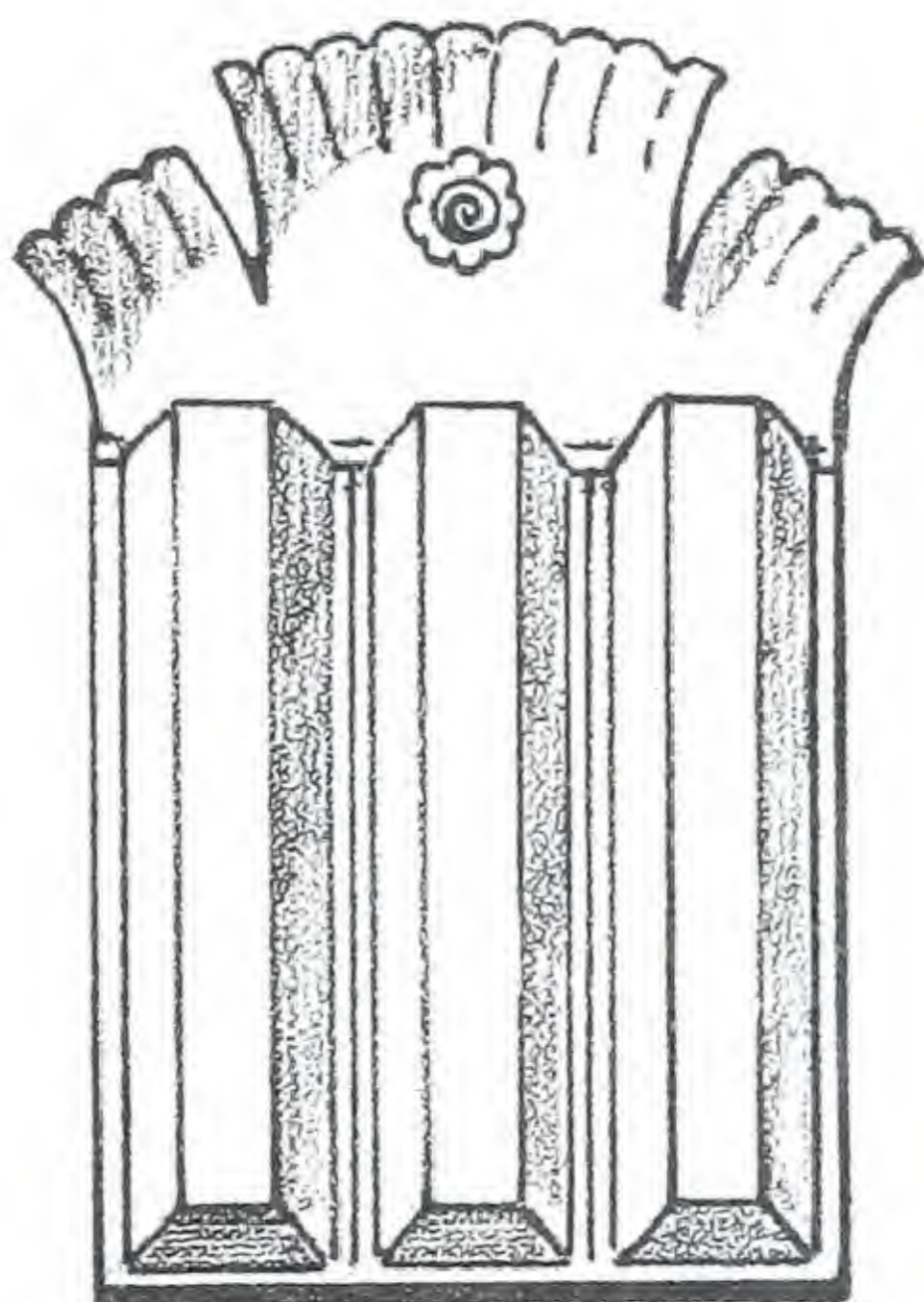
— ROUND MONAX BOWL —

— #12192 - 8" DIA. - 3" DEEP —
— #12146 - 10" DIA. - 3 $\frac{1}{2}$ " DEEP —
— #12147 - 12" DIA. - 4" DEEP —
— #12148 - 14 $\frac{1}{2}$ " DIA. - 4 $\frac{1}{2}$ " DEEP —
— #12195 - 16" DIA. - 5" DEEP —
— DRILLED WITH $\frac{1}{2}$ " CENTER HOLE —
— AVAILABLE ALSO IN IVORIAN GLASS —

— MODERN INTERIORS —
 — SIDE-WALL AS THE SOURCE OF LIGHT —



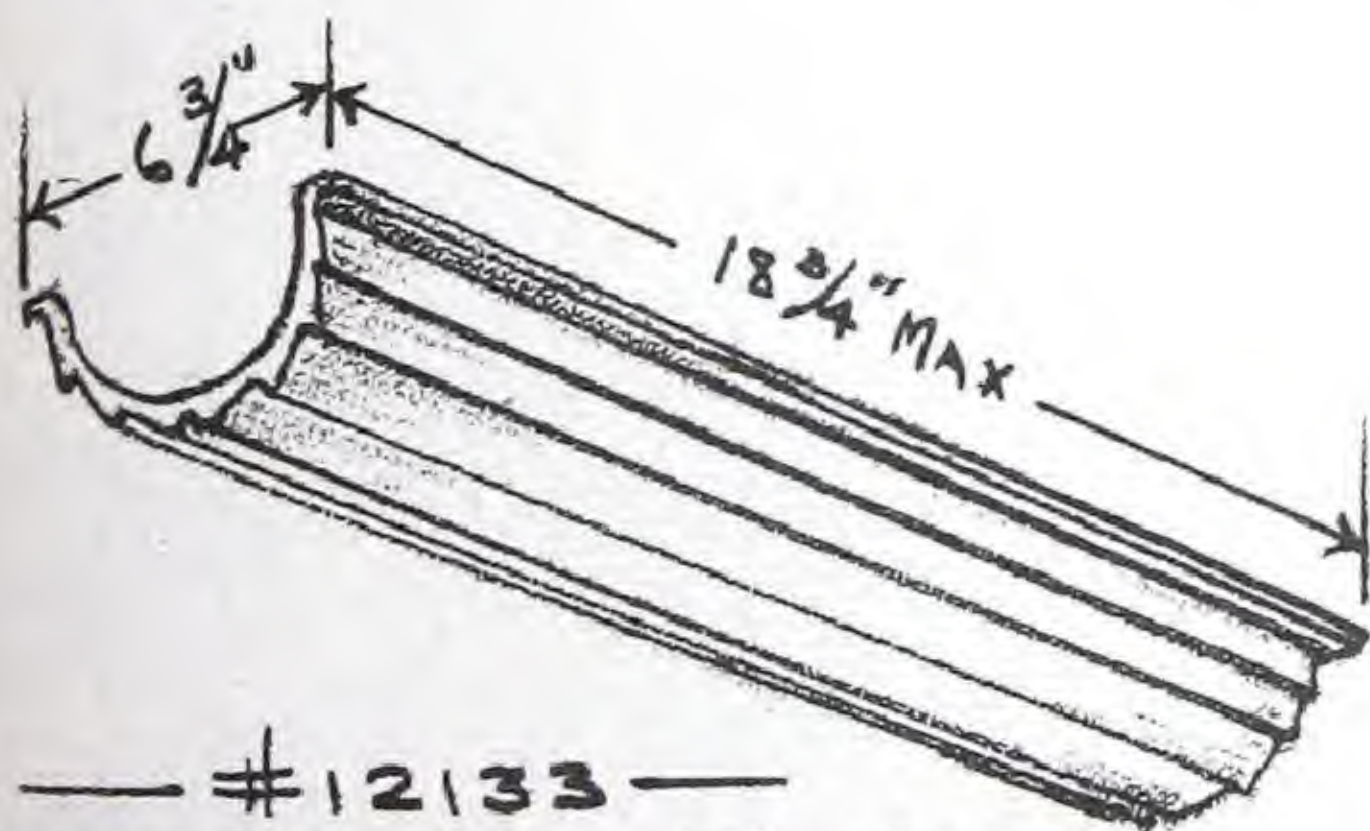
— # 12133 - FLUTED TROUGH —
 — CAN BE USED WHERE FINE —
 — DECORATION IS DESIRED —



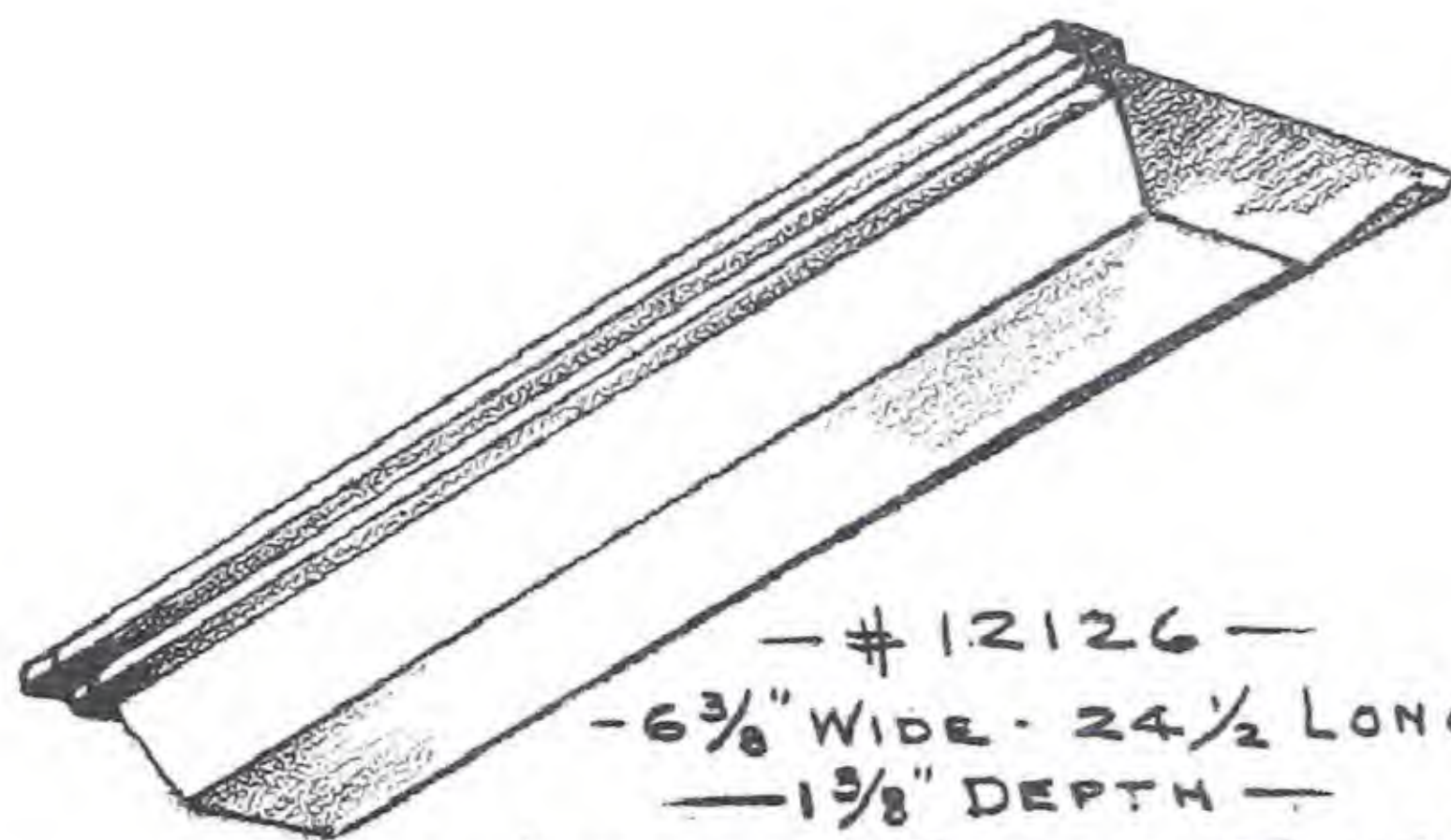
— # 12126 - CAN BE —
 — USED IN MULTIPLE —



— A SIMPLE BRACKET —
 — CAN BE MADE WITH —
 — # 12126 —

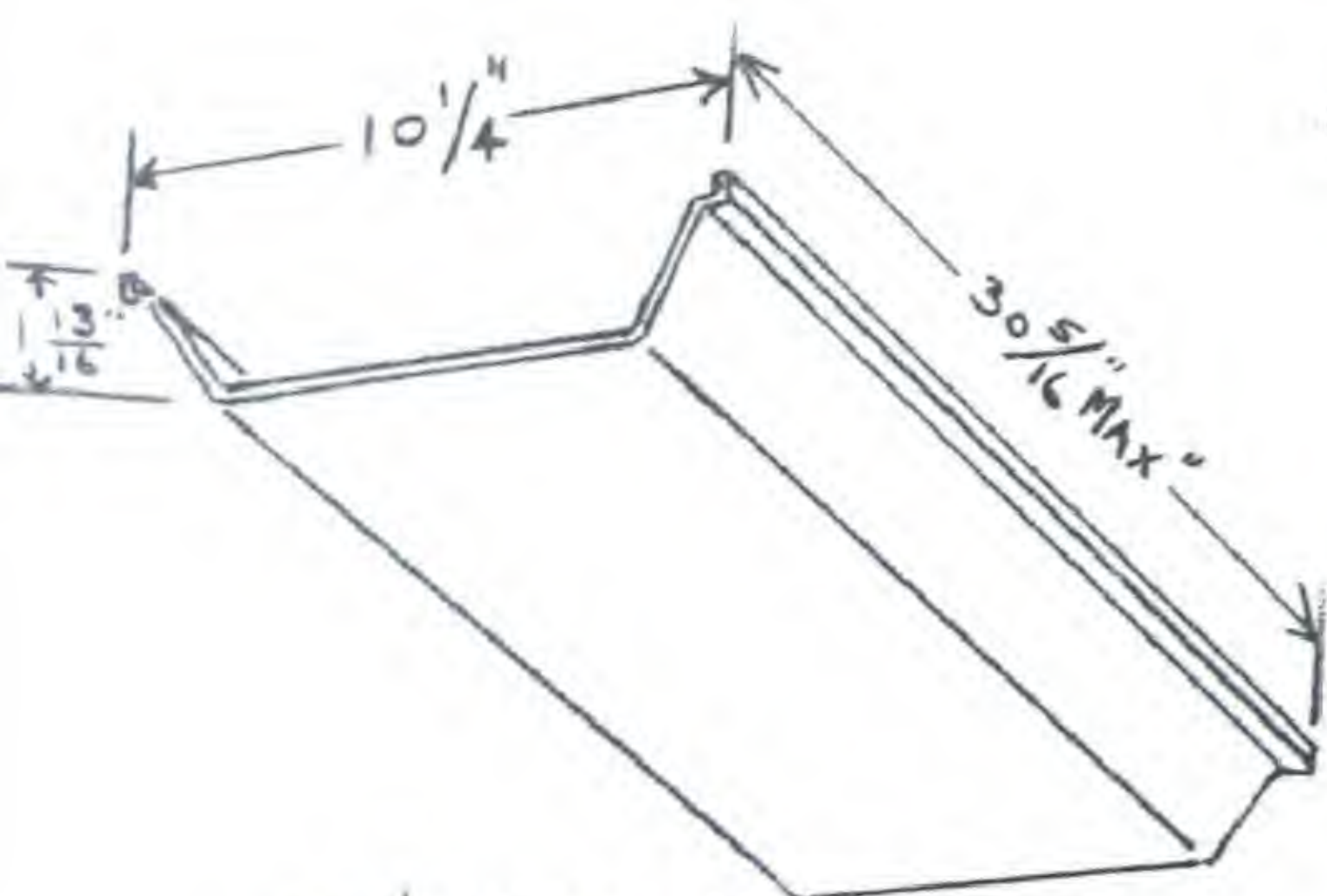
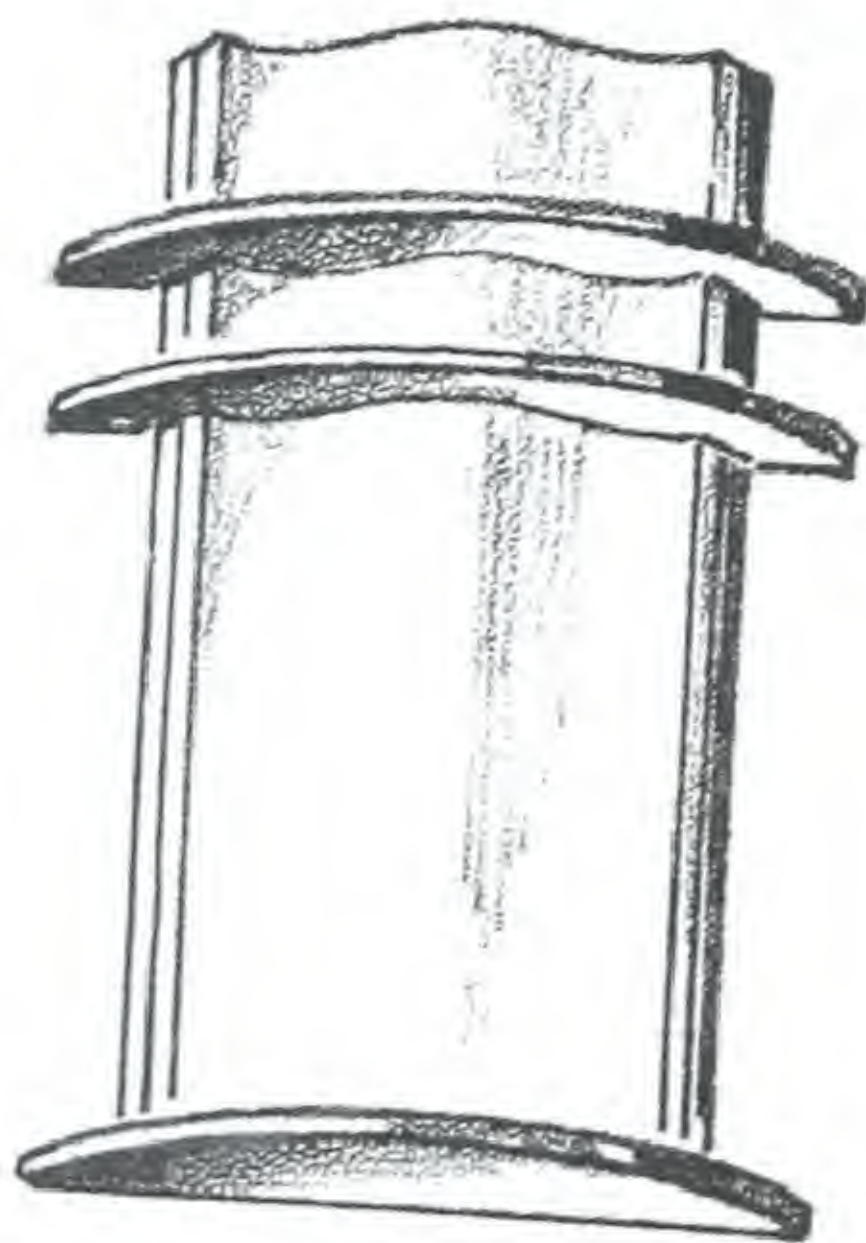
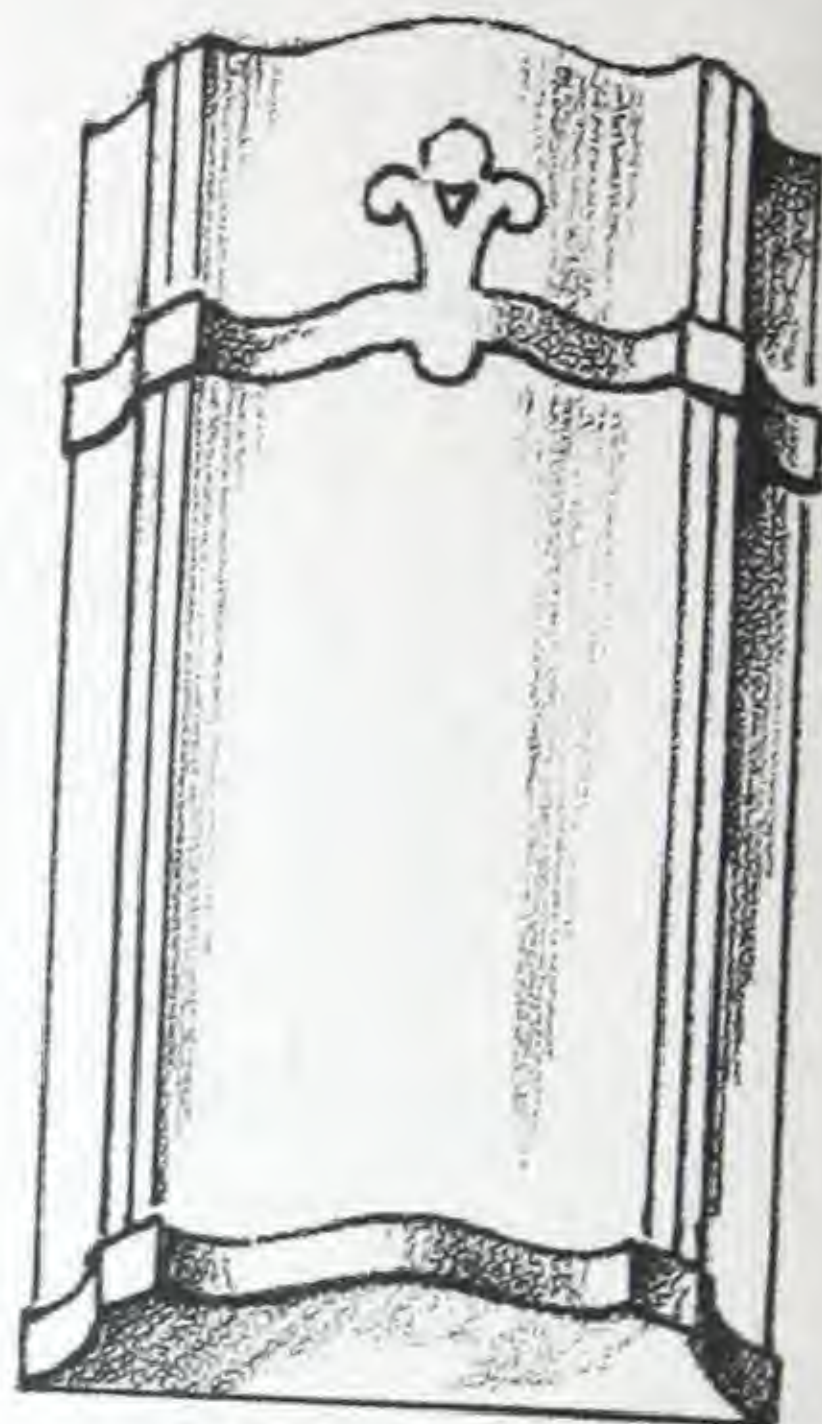
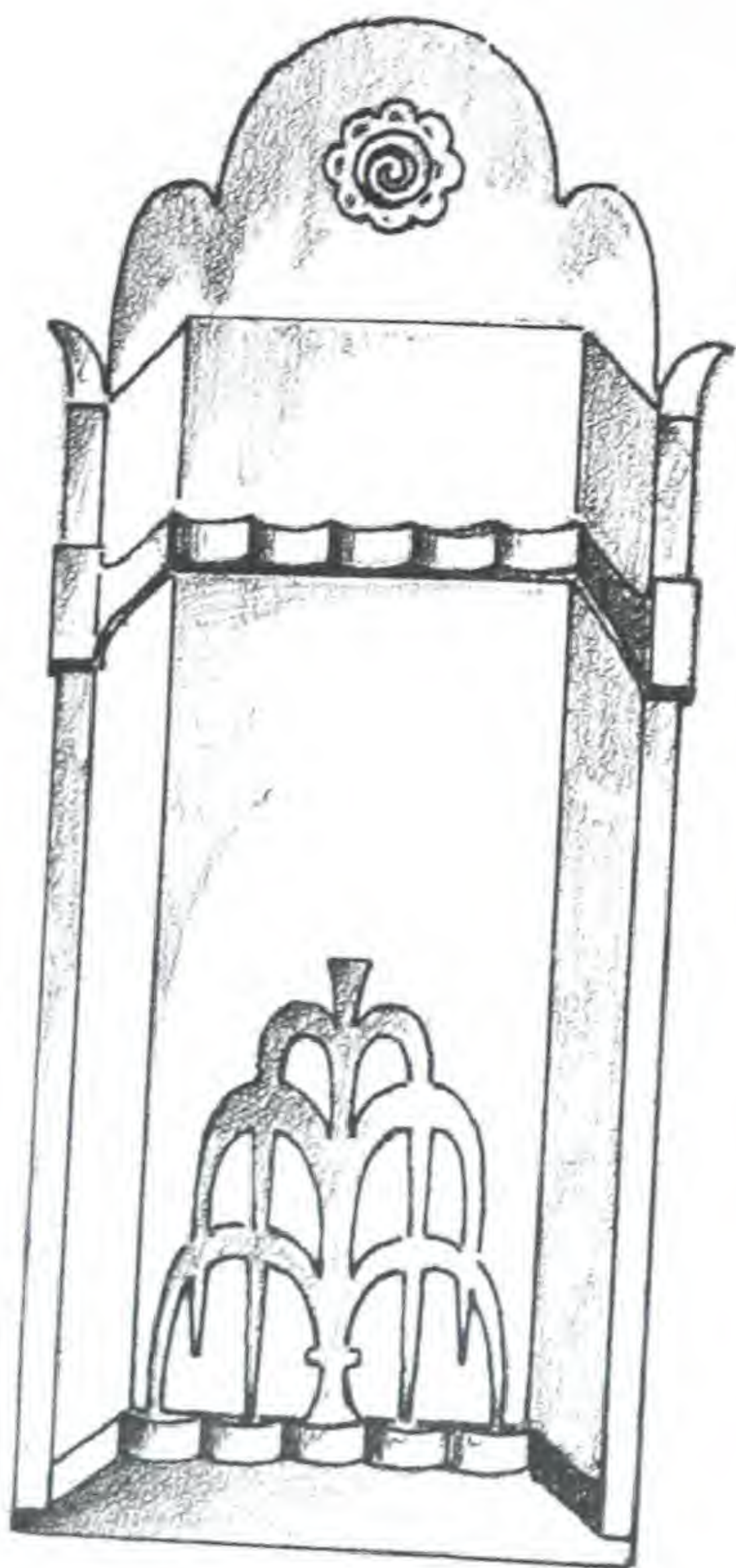


— # 12133 —
 — LUMITE - SATIN FINISH —
 — 4 7/16" DEEP —

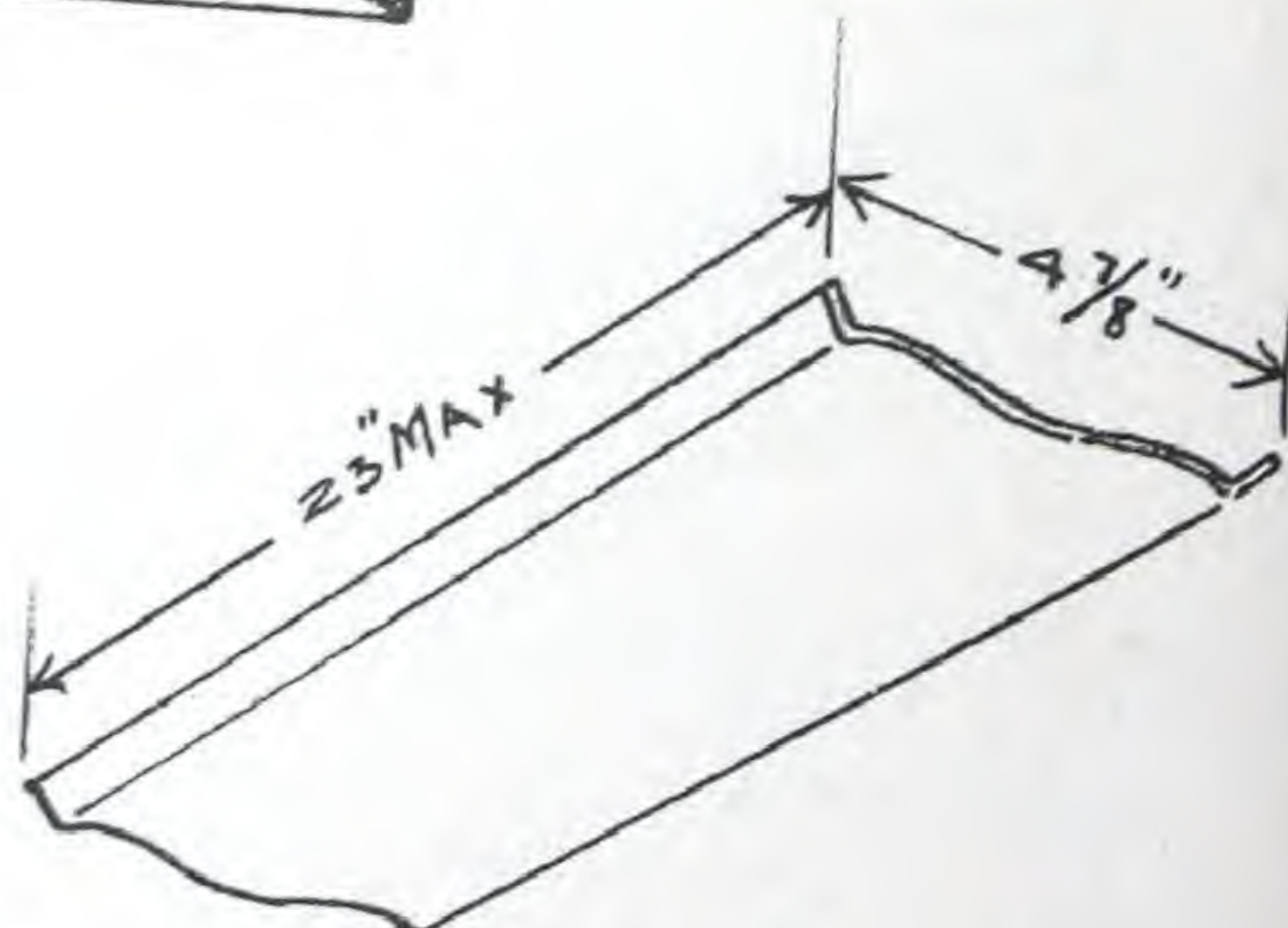


— # 12126 —
 — 6 3/8" WIDE - 24 1/2" LONG —
 — 1 3/8" DEPTH —
 LUMITE - SATIN FINISH

— MODERN INTERIORS —
— THE SIDEWALL AS THE SOURCE OF LIGHT —



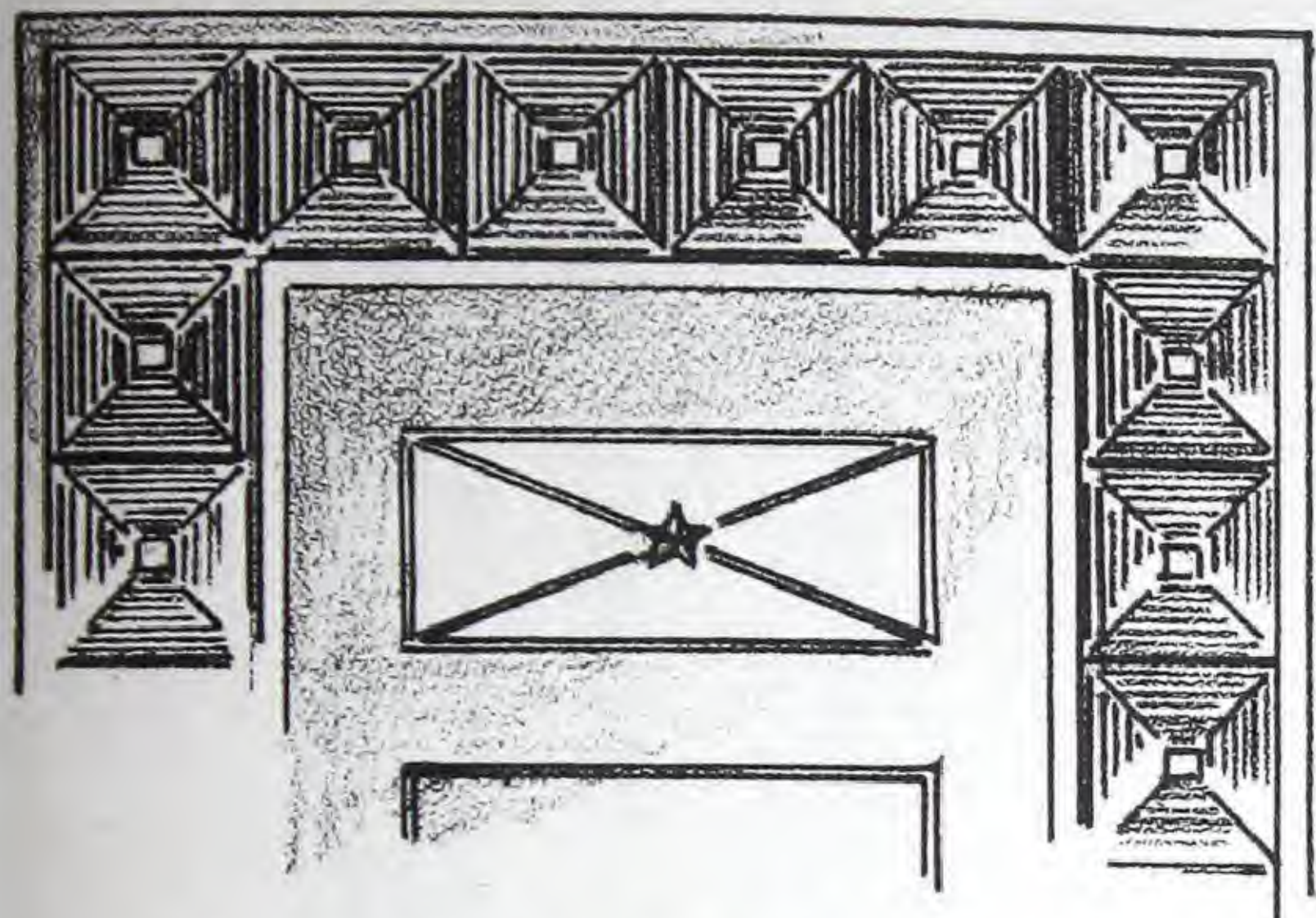
— #12151-MONAX —



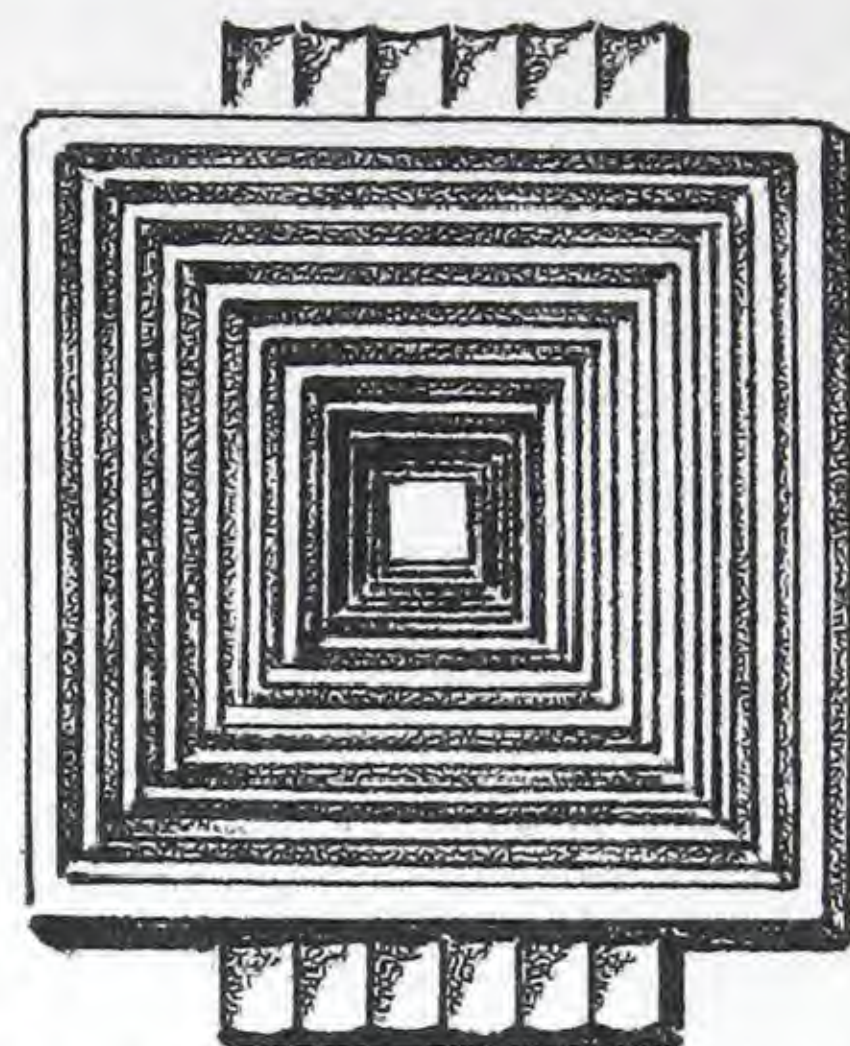
— 12141Q-MONAX —

— MODERN INTERIORS —

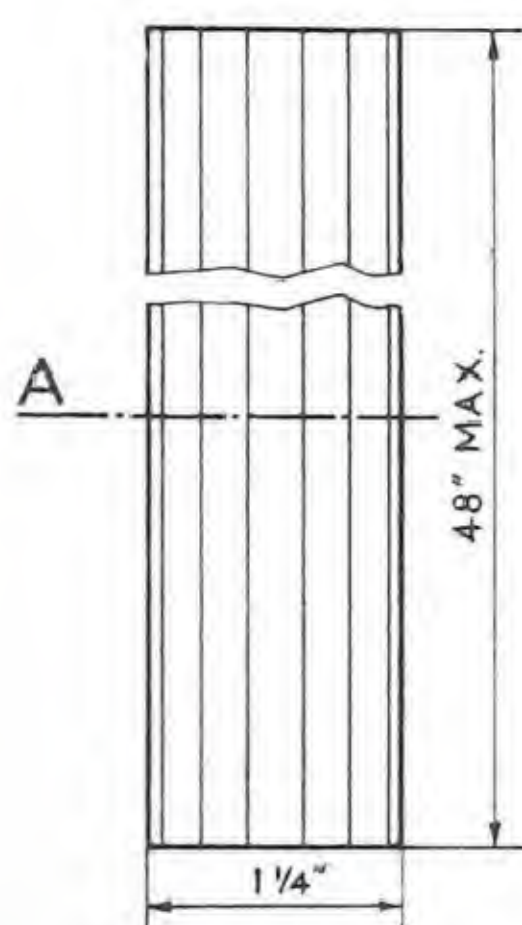
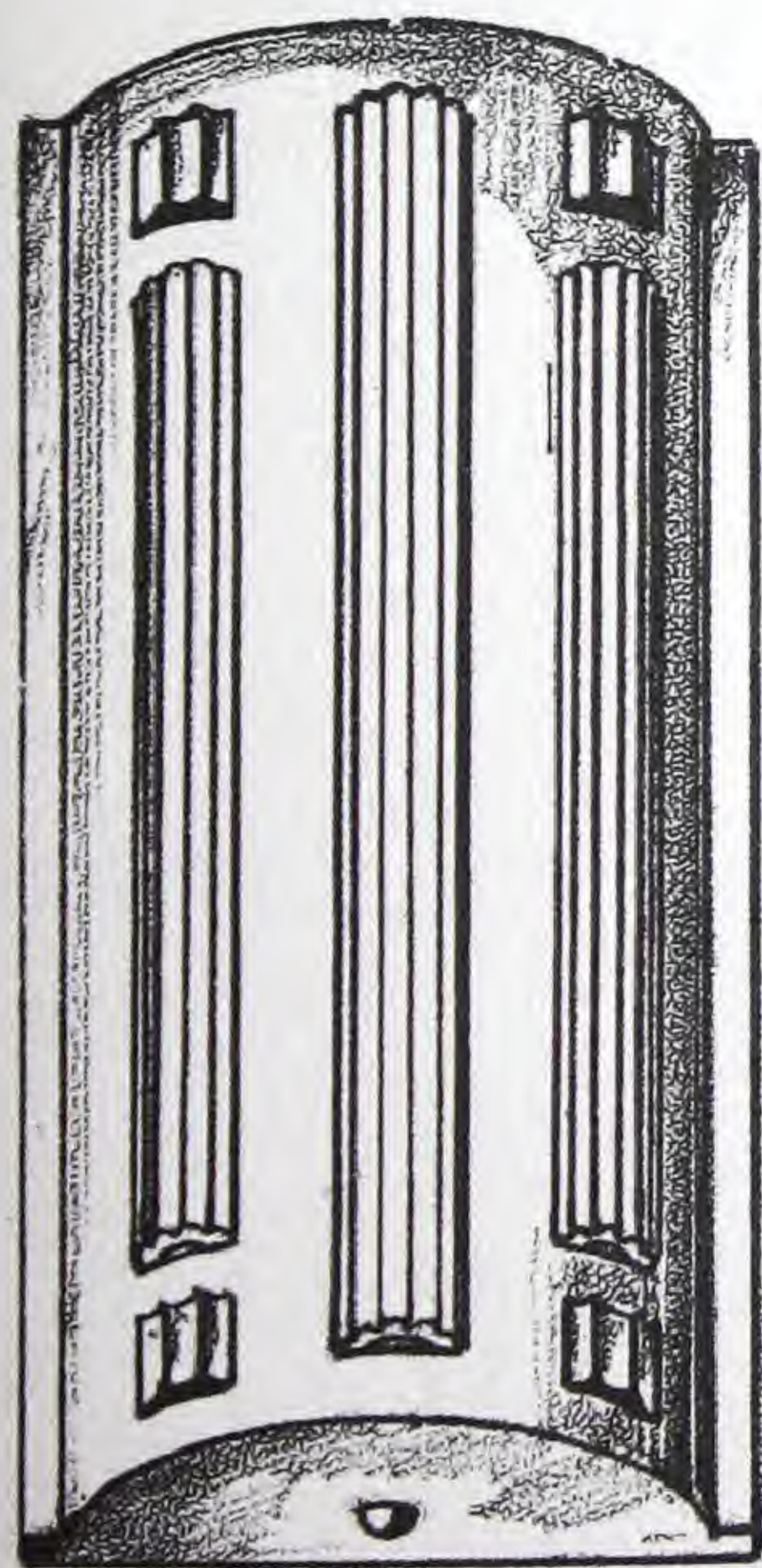
— THE SIDEWALL AS THE SOURCE OF LIGHT —



— A DOOR CAN BE FRAMED —
— WITH # 12117 PLATES —

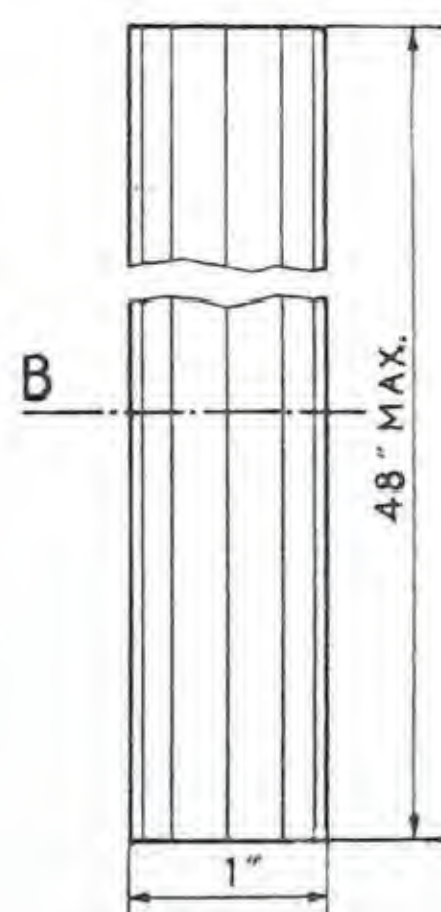


— A SIMPLE FRAME AROUND A GLASS PLATE —
12109 - 6 1/2" SQUARE } LUMITE-CLEAR
12117 - 8" SQUARE } PLATES
12120 - 12" SQUARE }

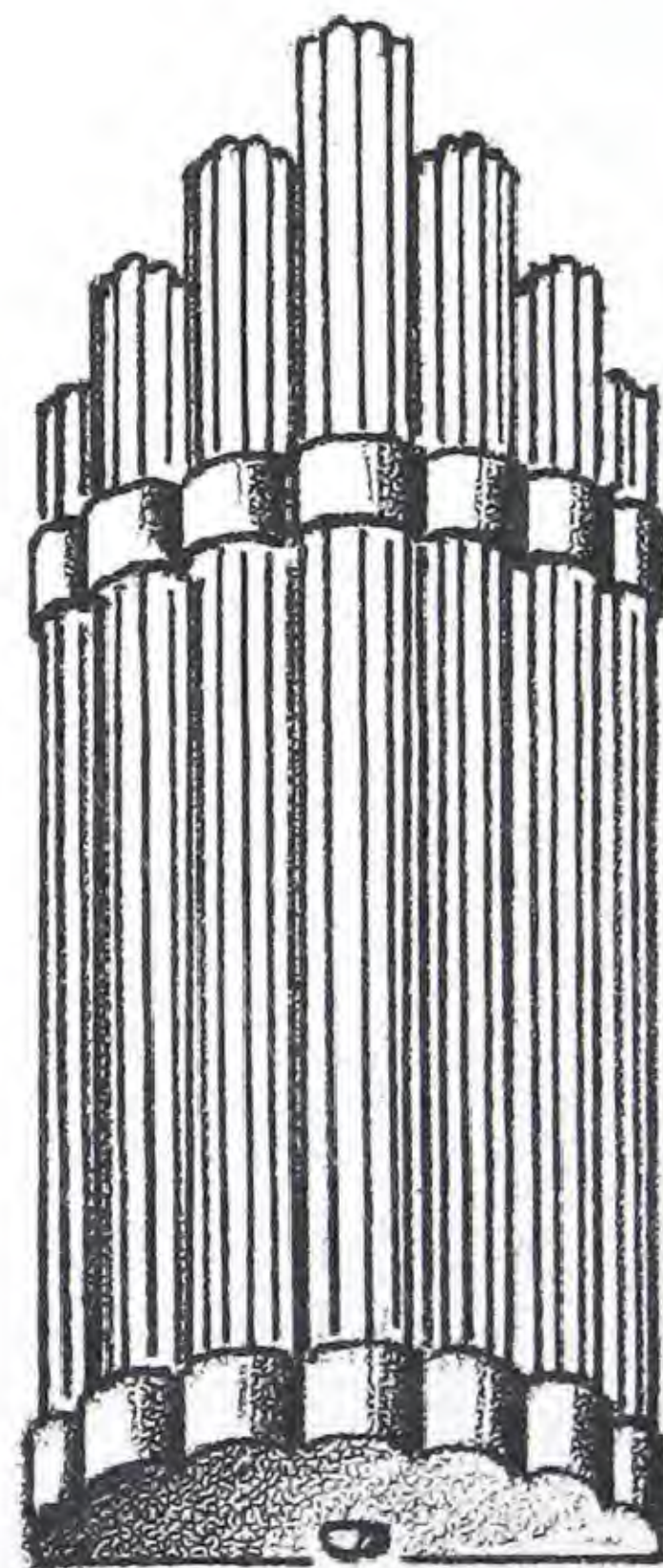


SECTION ON A
2147

— CLEAR —
— FLUTED —
— TUBES —



SECTION ON B
2146

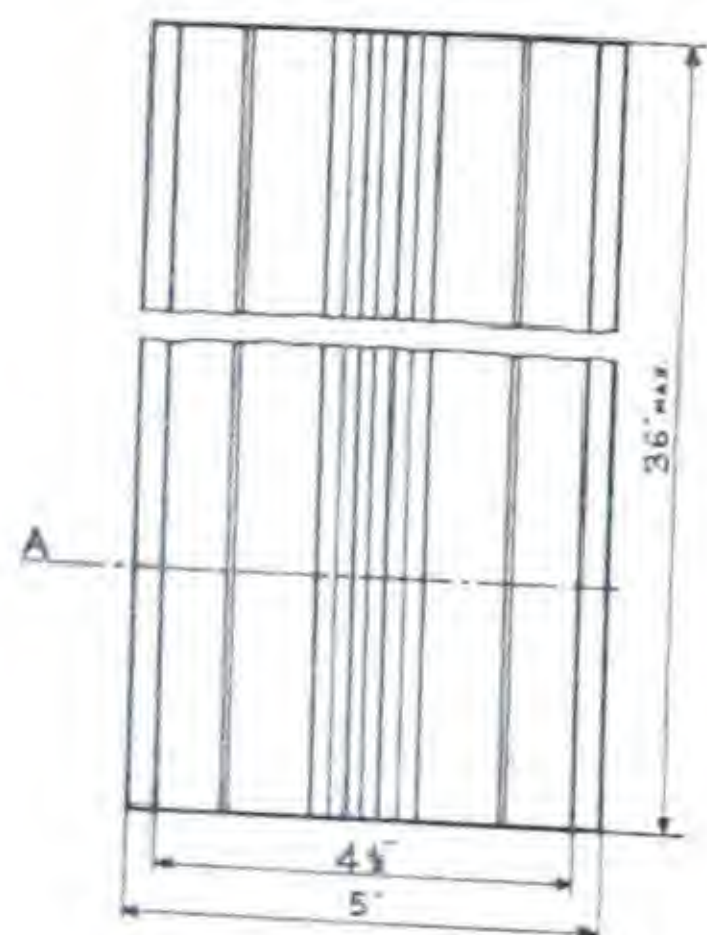
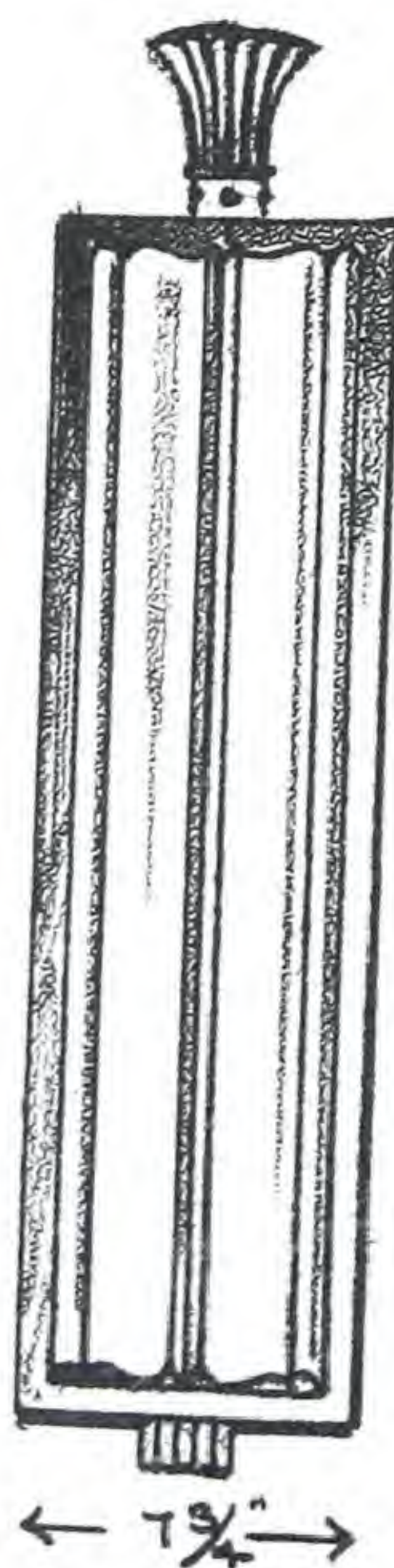
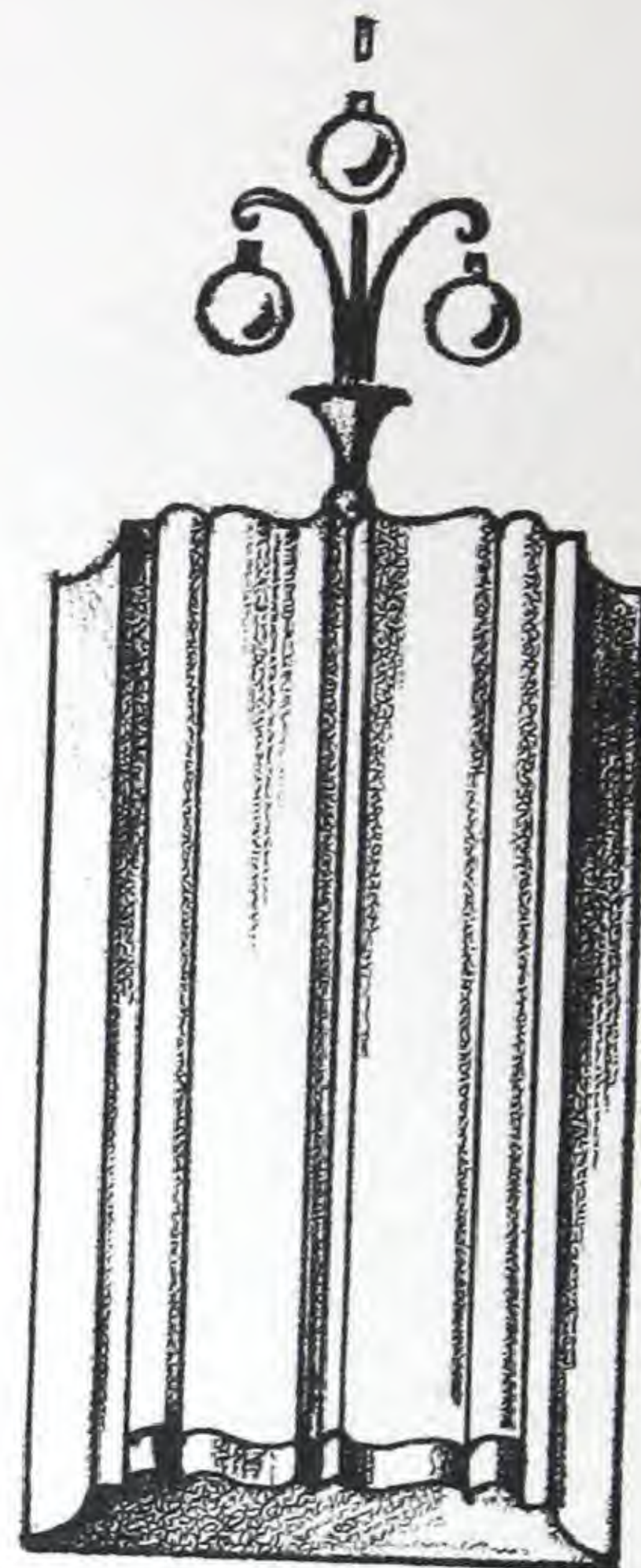
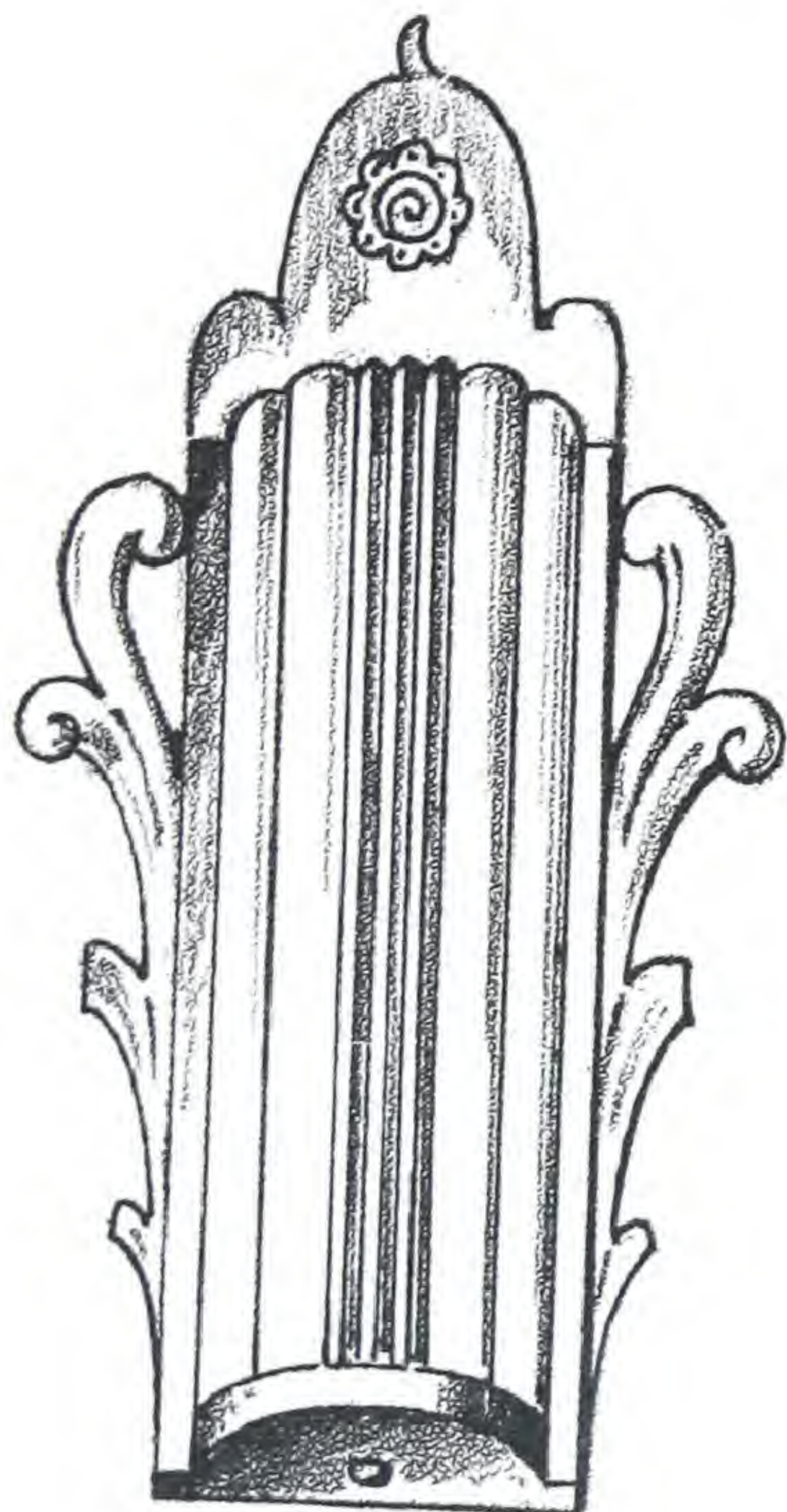


— # 2146 - COMBINED —
— WITH METAL —

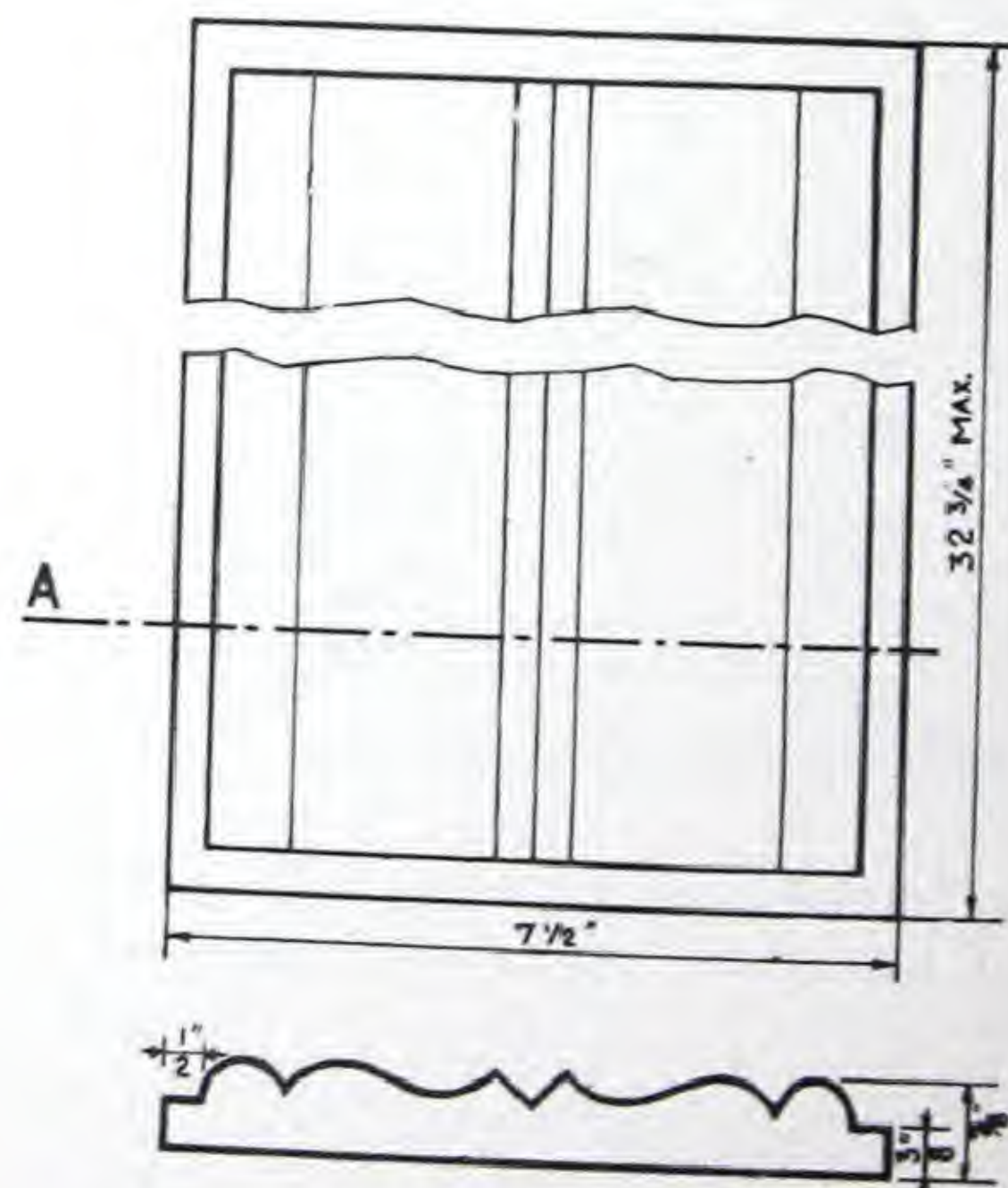
— A COMBINATION OF METAL —
— AND # 2147 GLASS TUBES —

— MODERN INTERIORS —

— THE - SIDEWALL - AS - THE - SOURCE - OF - LIGHT —



— #2037 —
— CLEAR OR FROSTED —



— #2006 —
— CLEAR OR FROSTED —

MI 12

— CORNING - GLASS - WORKS —

Store Lighting

The returns of merchandise will be decreased when customers are able to appraise color, texture and quality under correct lighting. The use of proper lighting glass will help achieve these results.

Those responsible for store lighting should give the problems of illumination complete study and consider all the factors involved. These factors vary for every store. The following outline is a basis of analysis for individual store problems.

1 - General appearance of the store:

Lighting fixtures should be inconspicuous. They should harmonize with interior architectural treatment. Light colored walls and ceilings help to decrease brightness contrasts.

2 - The lighting must effectively illuminate the merchandise. This involves a consideration of the type of merchandise being offered for sale and the methods utilized in displaying it.

3 - The proper and necessary amount of light must be ascertained. This is governed by:

A - The type of merchandises offered for sale.

B - The amount of illumination in competitive and neighboring stores - which are competing for the same customer's dollar.

C - The cost of lighting in relation to the total sales budget.

Make lighting a valuable asset for the store. The importance of illumination as a sales aid should be given full consideration.

It must not be forgotten that the initial cost of the lighting fixture is only a part of the total lighting cost. Power cost is an important factor, therefore luminaires that give the most effective returns for your power dollar, are essential. Glass has long been recognized as the medium for producing efficient illumination.

Consideration should be given to the problem of maintaining the luminaire in an efficient condition. The smooth surface of glass permits the luminaire to be easily cleaned.

4 - Lighting to create the atmosphere desired in the store.

The stage manager uses light to create an effect. Comparable use may be made of light in the store.

A - Food Stores "Atmosphere of cleanliness"

All types of food stores must have a sanitary appearance to attract buyers. Glass is easily kept clean.

B - General Merchandise Stores - "A busy atmosphere"

In these stores the merchandise can be featured more effectively by correctly utilized light than by any other means. Judicious use of glass for lighting will assist in correct utilization of light.

C - Apparel Stores - "A personal atmosphere"

Shoe stores, dress shops, clothing and similar stores require lighting effects of an intimate character. In these stores novel lighting may be used. In most instances it is desirable to simulate as closely as possible the actual lighting conditions under which the merchandise will be used after purchase. Illumination must be sufficient and glass is an invaluable tool to produce good lighting.

Recommended Standard of Illumination

Simplified Illumination Calculation Procedure

First

Determine foot-candles required from Table 1.

Second

Determine "Conditions Factor" for the interior, whether "Favorable", "Average" or "Unfavorable". The "Conditions Factor" will depend upon the room proportions, color of ceiling and upper walls, and the maintenance of equipment. Typical "Average Conditions Factor" consists of -

Room proportions	
Width approximately twice ceiling height	
Color of ceiling and walls	Medium
Maintenance of equipment	Fair

The "Conditions Factor" becomes more "Favorable" as the width of the interior increase in proportion to its height, as the color of ceiling and upper walls becomes lighter, and as the maintenance of equipment improves.

Third

Decide which type of illuminating glassware (Monax, or Galax, or Denax) is desired.

Fourth

Decide mounting height. Ordinarily, an overall fixture length (ceiling to underside of enclosing globe) of one-fourth ceiling height may be used. Ceiling type fitters should be used on low ceilings.

Fifth

Locate in first column, Table 2, the contemplated "Area Per Outlet" or "Approximate Spacing" and further narrow this down to the "Conditions Factor" determined in second step. Then traverse Table 2 horizontally to the right until the desired foot-candle intensity (as determined in first step) is located in the correct glassware section. If not so found, then go to a closer spacing until desired foot-candle intensity is located. Directly above in the column heading is the required lamp size.

Table 1

Recommended Standards for Good Store Illumination

	Food Stores		General Merchandise Stores		Apparel Stores	
	<u>Gen'l Ltg</u>	<u>*Display Ltg</u>	<u>Gen'l Ltg</u>	<u>*Display Ltg</u>	<u>Gen'l Ltg</u>	<u>*Display Ltg</u>
Large Cities						
Brightly Lighted Districts	30	50 - 100	30	50 - 100	20	50 - 100
Secondary Business Locations (Upper floors)	15	30 - 100	15	30 - 100	12	30 - 100
Neighborhood Stores	10	20 - 50	10	20 - 50	10	20 - 50
Medium Size Cities						
Brightly Lighted Districts	20	30 - 100	20	30 - 100	15	30 - 100
Neighborhood Stores	10	20 - 50	10	20 - 50	10	20 - 50

Table 1 (Continued)

		General					
		Food Stores		Merchandise Stores		Apparel Stores	
		Gen'l	*Display	Gen'l	*Display	Gen'l	*Display
		Ltg	Ltg	Ltg	Ltg	Ltg	Ltg

Small Size Cities & Towns
Brightly Lighted
Districts

15 20 - 50 15 20 - 50 12 20 - 50

* Dark Colored Displays require more illumination than light colored displays.

Note: The above intensities for display lighting do not include show window lighting where higher intensities are required to overcome daylight reflections.

TABLE 2
AVERAGE FOOT CANDLES

Area Per Outlet or Approximate Spacing	Condition or Room for Good Lighting	MONAX				GALAX				DENAX				
		Semi-Direct Lighting				Semi-Indirect Lighting				Luminous Indirect Lighting				
		150	200	300	500	150	200	300	500	16" Bowl	18" Bowl	22" Bowl	24" Bowl	26" Bowl
		Lamp	Lamp	Lamp	Lamp	Lamp	Lamp	Lamp	Lamp	Watt	Watt	Watt	Watt	Watt
55-65 Sq Ft or 7-3/4' x 7-3/4'	Favorable	13-18	18-24			10-14	15-22	22-30		10-14	15-22	22-30		
Spacing	Average	9-13	12-17			6-10	10-15	14-22		6-10	10-15	14-22		
	Unfavorable	6-8	9-11			4-6	6-9	10-14		4-6	6-9	10-14		
65-75 Sq Ft or 8-1/2' x 8-1/2'	Favorable	12-16	16-21	24-34		9-13	13-18	19-27	34-45	9-13	13-18	19-27	34-45	50-67
Spacing	Average	8-11	11-15	16-24		5-9	8-12	12-19	22-34	5-9	8-12	12-19	22-34	33-50
	Unfavorable	5-7	8-10	10-16		3-5	5-7	8-12	14-22	3-5	5-7	8-12	14-22	21-33
75-85 Sq Ft or 9' x 9'	Favorable	10-13	14-18	22-29		8-11	11-16	18-24	29-41	8-11	11-16	18-24	29-41	43-59
Spacing	Average	7-9	9-13	15-22		5-8	7-10	12-18	18-28	5-8	7-10	12-18	18-28	27-43
	Unfavorable	4-7	6-8	9-15		3-5	5-6	9-12	13-18	3-5	5-6	9-12	13-18	19-27
85-95 Sq Ft or 9-1/2' x 9-1/2'	Favorable	9-12	12-16	19-27	31-43	7-10	10-14	16-22	25-36	7-10	10-14	16-22	25-36	37-50
Spacing	Average	6-8	8-11	13-18	20-31	5-7	6-9	11-16	16-24	5-7	6-9	11-16	16-24	24-37
	Unfavorable	4-6	5-7	8-12	13-20	3-4	4-5	7-11	10-15	3-4	4-5	7-11	10-15	16-24
95-110 Sq Ft or 10' x 10'	Favorable	8-10	10-14	17-23	29-37	6-9	9-12	15-20	23-33	6-9	9-12	15-20	23-33	34-46
Spacing	Average	6-8	7-9	11-16	20-28	4-6	6-8	9-14	15-23	4-6	6-8	9-14	15-23	22-34
	Unfavorable	3-5	4-6	7-10	13-20	2-4	3-5	6-9	9-14	2-4	3-5	6-9	9-14	15-22
110-125 Sq Ft or 11' x 11'	Favorable	7-9	9-12	15-20	25-34	5-7	8-11	13-18	20-30	5-7	8-11	13-18	20-30	30-40
Spacing	Average	4-5-6	6-8	9-14	18-24	4-5	5-7	9-12	13-20	4-5	5-7	9-12	13-20	19-30
	Unfavorable	3-4	4-6	6-9	11-17	2-4	3-5	6-9	9-12	2-4	3-5	6-9	9-12	13-19
125-145 Sq Ft or 11-1/2' x 11-1/2'	Favorable	5-8	8-11	13-17	22-30	5-6	7-9	11-16	18-26	5-6	7-9	11-16	18-26	25-34
Spacing	Average	4-5	5-7	8-12	14-21	3-5	4-6	7-10	12-18	3-5	4-6	7-10	12-18	16-25
	Unfavorable	3-4	4-5	5-8	9-14	2-3	3-4	5-7	8-11	2-3	3-4	5-7	8-11	12-16
145-170 Sq Ft or 12-1/2' x 12-1/2'	Favorable	5-6	7-10	10-15	19-25	3-5-5	6-8	9-13	17-24	3-5-5	6-7	9-13	17-24	22-30
Spacing	Average	3-4	5-7	7-10	13-18	2-3	3-5	6-9	11-17	2-3	3-5	6-9	11-17	13-22
	Unfavorable	3-4	4-5	5-7	8-12	2-3	3-4	5-7	8-11	2-3	3-4	5-7	8-11	9-13
170-200 Sq Ft or 13-1/2' x 13-1/2'	Favorable		6-8	9-12	17-22	750 W Lamp 20"	5-6	8-11	14-19		5-6	8-11	14-19	18-25
Spacing	Average		4-6	6-9	11-16	Lamp 20"	3-4	5-8	9-14		3-4	5-8	9-14	12-18
	Unfavorable		3-4	4-6	7-10	Globe	2-3	3-5	6-9		2-3	3-5	6-9	8-12
200-230 Sq Ft 14-3/4' x 14-3/4'	Favorable		5-6	8-11	14-20	18-23	4-5	7-10	12-16		4-5	7-10	12-16	15-23
Spacing	Average		3-5	5-8	9-13	11-16	3-4	4-7	8-12		3-4	4-7	8-12	10-15
	Unfavorable		2-5-3	3-5-5	6-9	7-10	2-0-3	3-4	5-8		2-3	3-4	5-8	7-10
230-260 Sq Ft or 15-1/2' x 15-1/2'	Favorable		4-5-5	7-10	12-17	15-21	3-5-4	6-8	10-14		3-4	6-8	10-14	15-21
Spacing	Average		3-4	5-7	9-11	10-15	3-0-35	4-6	7-10		2-3	4-6	7-10	9-14
	Unfavorable		2-3	3-5	6-8	7-10		2-4	4-7		2-3	4-6	7-10	6-9
260-300 Sq Ft or 16-3/4' x 16-3/4'	Favorable		3-5-5	6-8	11-15	13-18	3-4	5-7	9-12		2-4	5-7	9-12	12-18
Spacing	Average		3-0-35	4-5	7-10	8-13		3-5	5-8		2-4	3-5	5-8	9-12
	Unfavorable			3-4	5-7	5-8		2-3	3-5			2-3	3-5	5-8
300-340 Sq Ft or 18' x 18'	Favorable			5-7	10-13	12-14		4-6	8-11			4-6	8-11	10-14
Spacing	Average			3-5-4	6-9-5	7-11		3-4	5-8			3-4	5-8	7-10
	Unfavorable			2-5-3	4-6-5	4-7		3-4	5-8			3-4	5-8	4-7
340-390 Sq Ft or 19' x 19'	Favorable			4-6	8-11	10-12		3-5-5	7-10			3-5-5	7-10	10-12
Spacing	Average			3-4	5-5-8	6-10		2-3	4-7			2-3	4-7	6-10
	Unfavorable			2-3	3-5-5	4-6		3-4	5-8			3-4	5-8	4-6
390-440 Sq Ft or 20-1/2' x 20-1/2'	Favorable			3-5-5	7-10	9-11		3-5	6-8			3-5	6-8	9-11
Spacing	Average			25-30	5-7	5-9		1-3	4-6			1-3	4-6	5-9
	Unfavorable				3-5	3-5		3-4	5-7			3-4	5-7	3-5
440-500 Sq Ft or 21-3/4' x 21-3/4'	Favorable				6-9	7-10		3-4	5-7			3-4	5-7	7-10
Spacing	Average				4-6	4-7		3-5	5-7			3-5	5-7	4-6
	Unfavorable				2-5-4	2-4		2-3	3-5			2-3	3-5	2-4

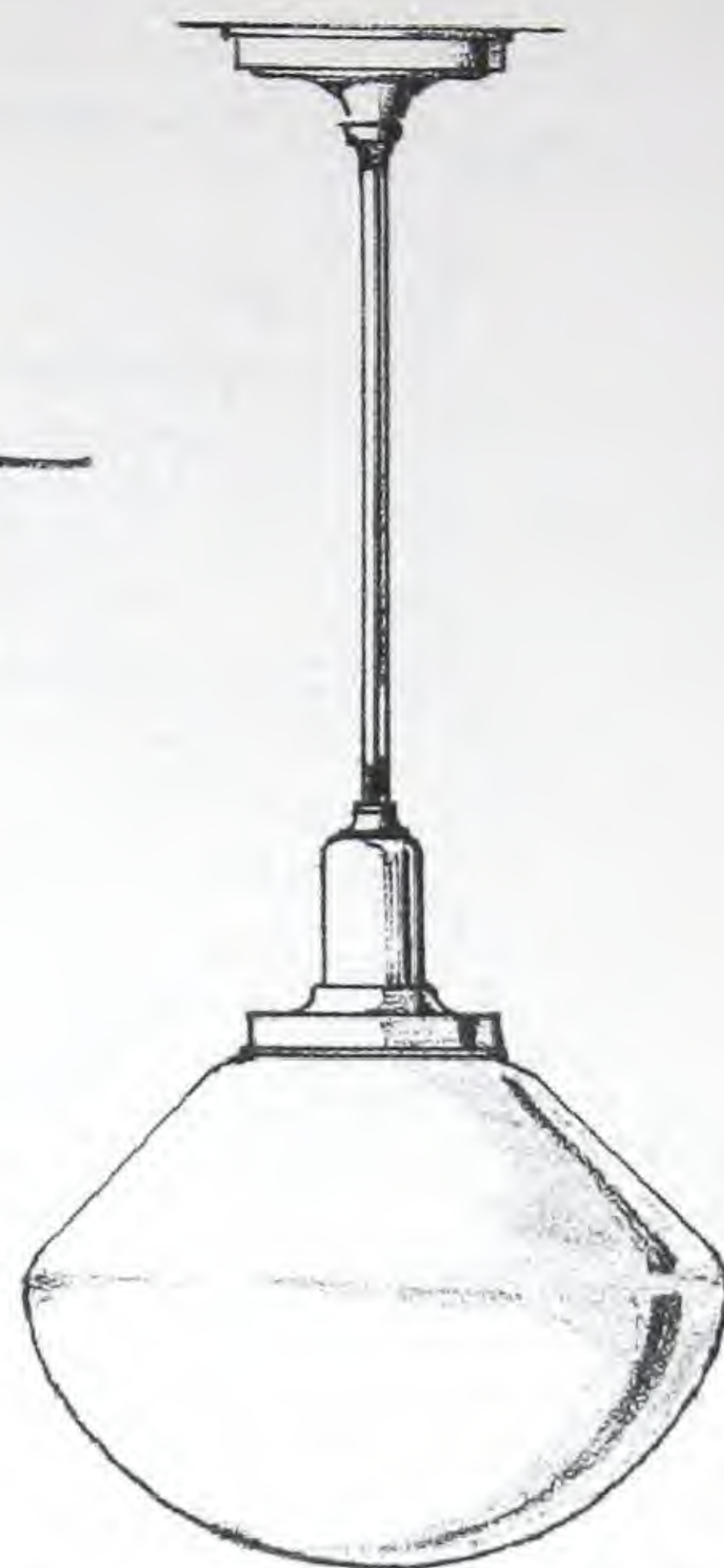
*Figures given are for MONAX Semi-Direct Lighting Decrease by 5% for GALAX Semi-Indirect Lighting

— LIGHTING-FOOD STORES —



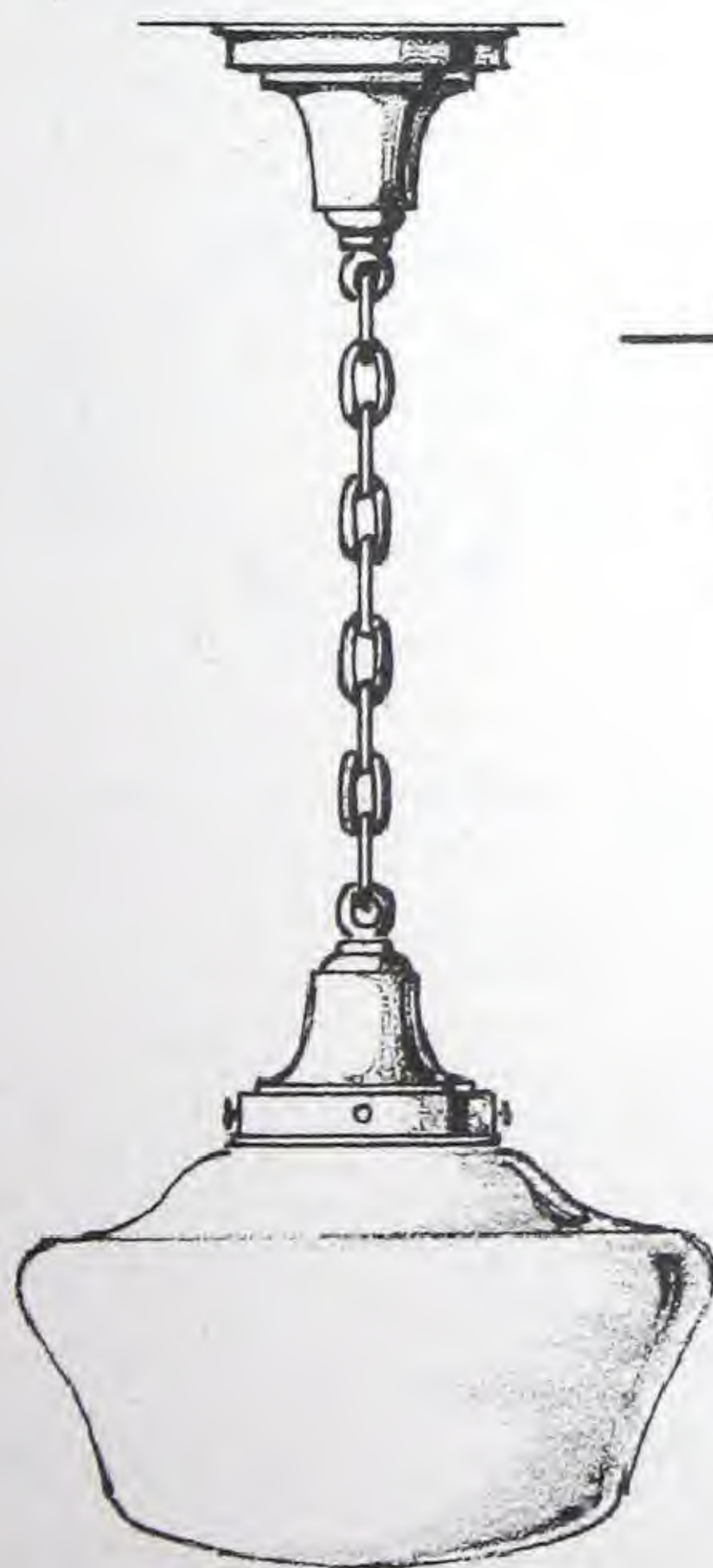
— THE - PILGRIM -
— MONAX —
— SEMI - DIRECT —

— FOR - LOW - CEILINGS —



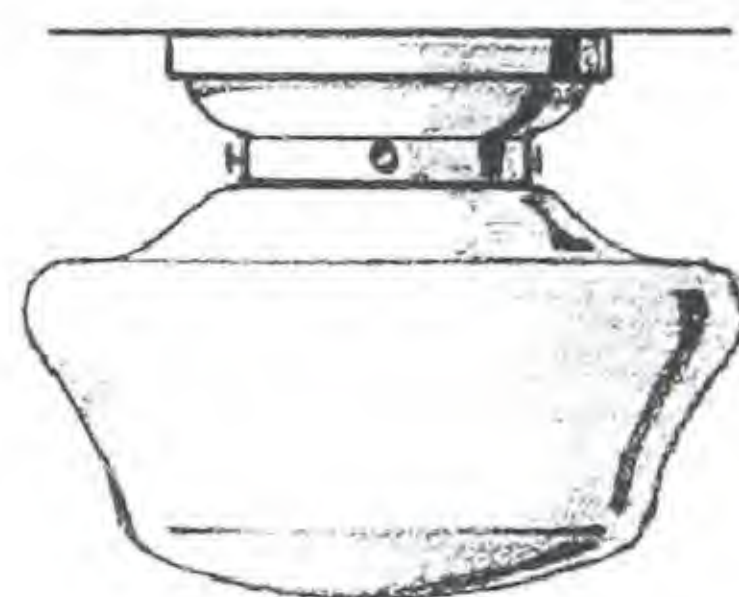
— FOR - HIGH - CEILINGS —

Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
12300	Monax	8 7/16	7	4
12301	Monax	9 7/16	7 1/2	4
12302	Monax	10 7/16	8 5/16	4
12304	Monax	12	9 3/16	6
12305	Monax	14	10 1/2	6
12306	Monax	16	11 3/4	6
12307	Monax	18	13 3/16	6



— THE - SEVILLE -
— MONAX —
— SEMI - DIRECT —

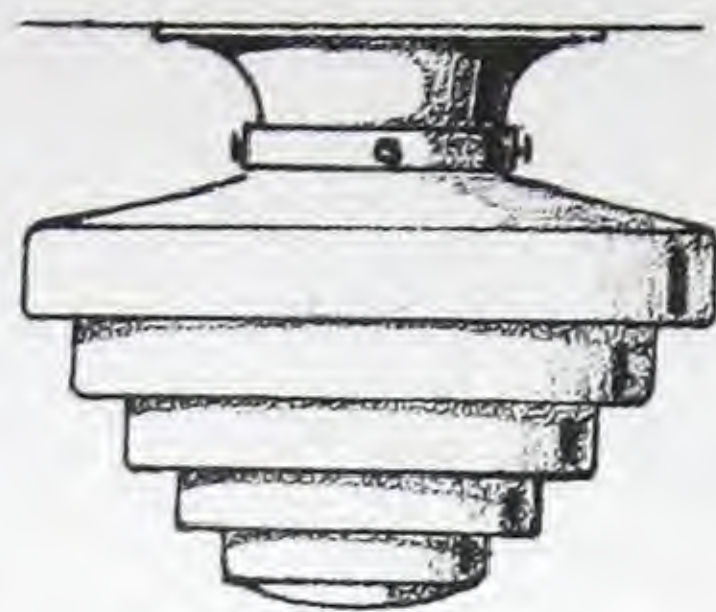
— FOR - LOW - CEILINGS —



— FOR - HIGH - CEILINGS —

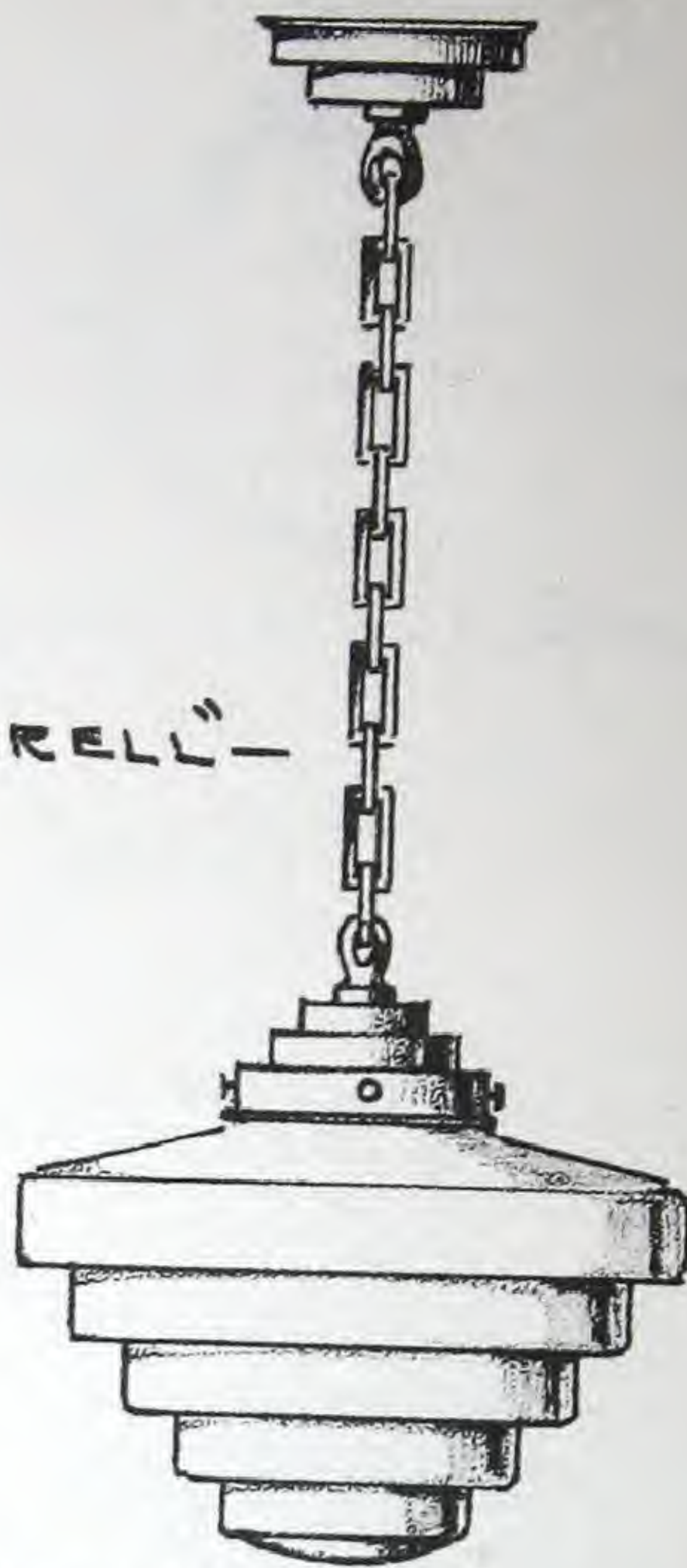
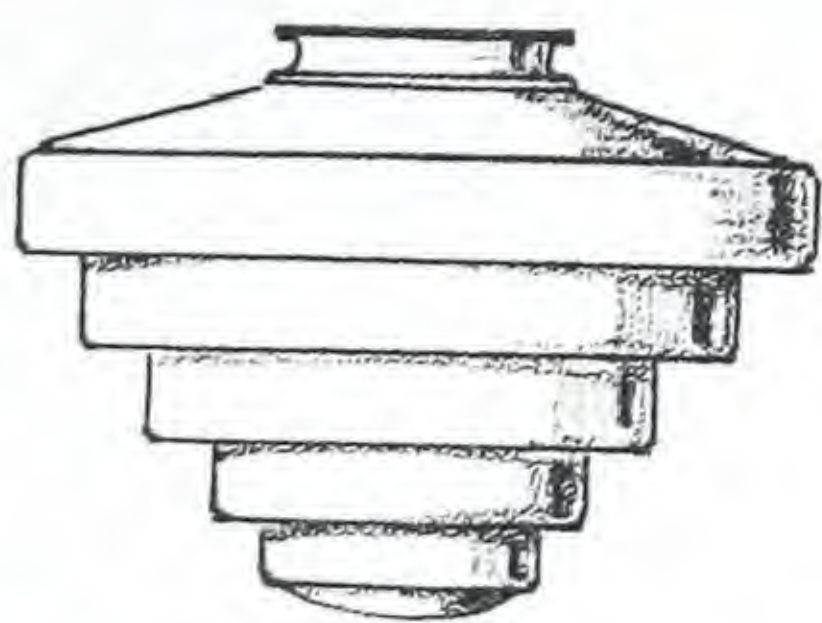
Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
5294-A	Monax	8 1/2	5 9/16	4
5340	Monax	9	6 1/2	4
5295	Monax	10	6 1/2	4
5296	Monax	12	7 3/4	6
5296-A	Monax	12	7 3/4	4
5297	Monax	14	9	6
5298	Monax	16	10 1/4	6
5645-A	Monax	18	11 3/8	6
5666	Monax	20	12 3/4	8

— LIGHTING-FOOD-STORES —



— FOR - LOW - CEILINGS —

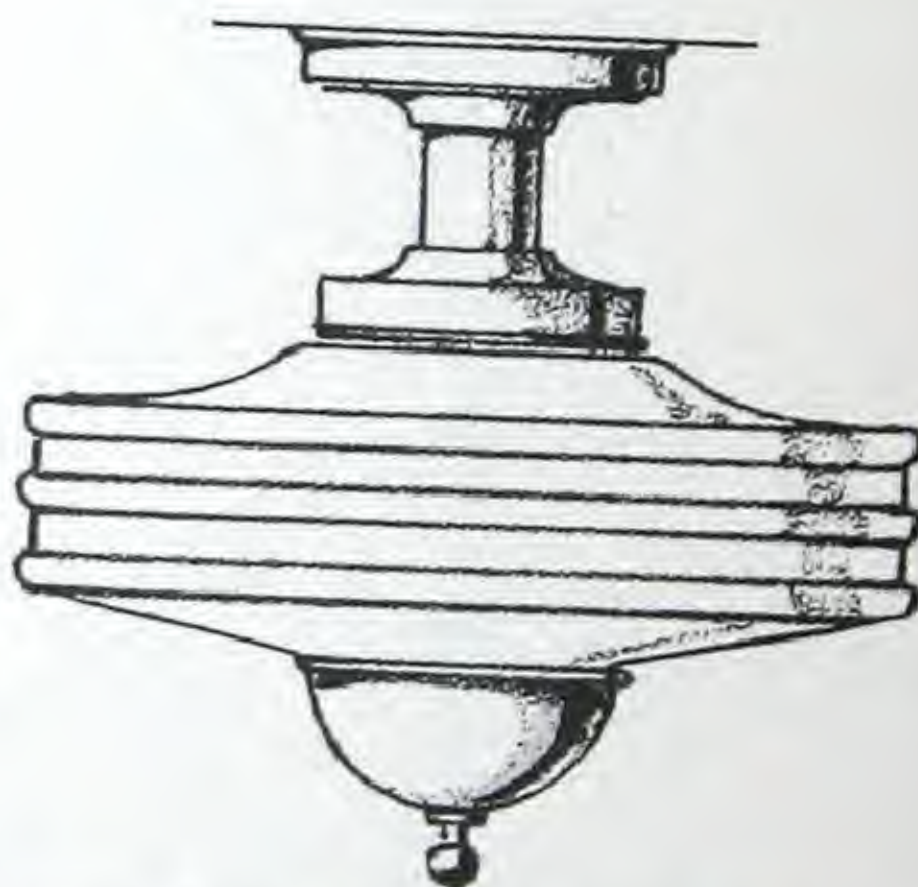
— THE ORIGINAL "TERRELL" —
— MONAX —



— FOR - HIGH - CEILINGS —

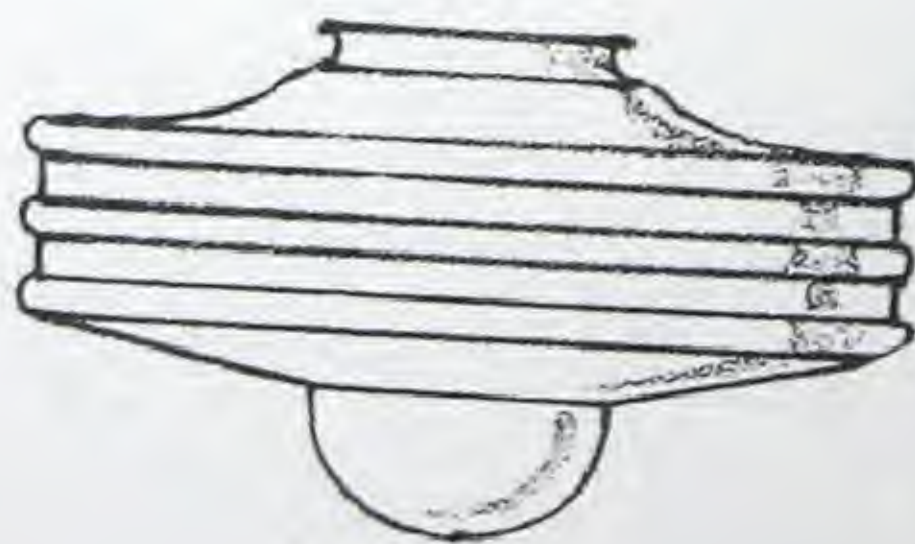
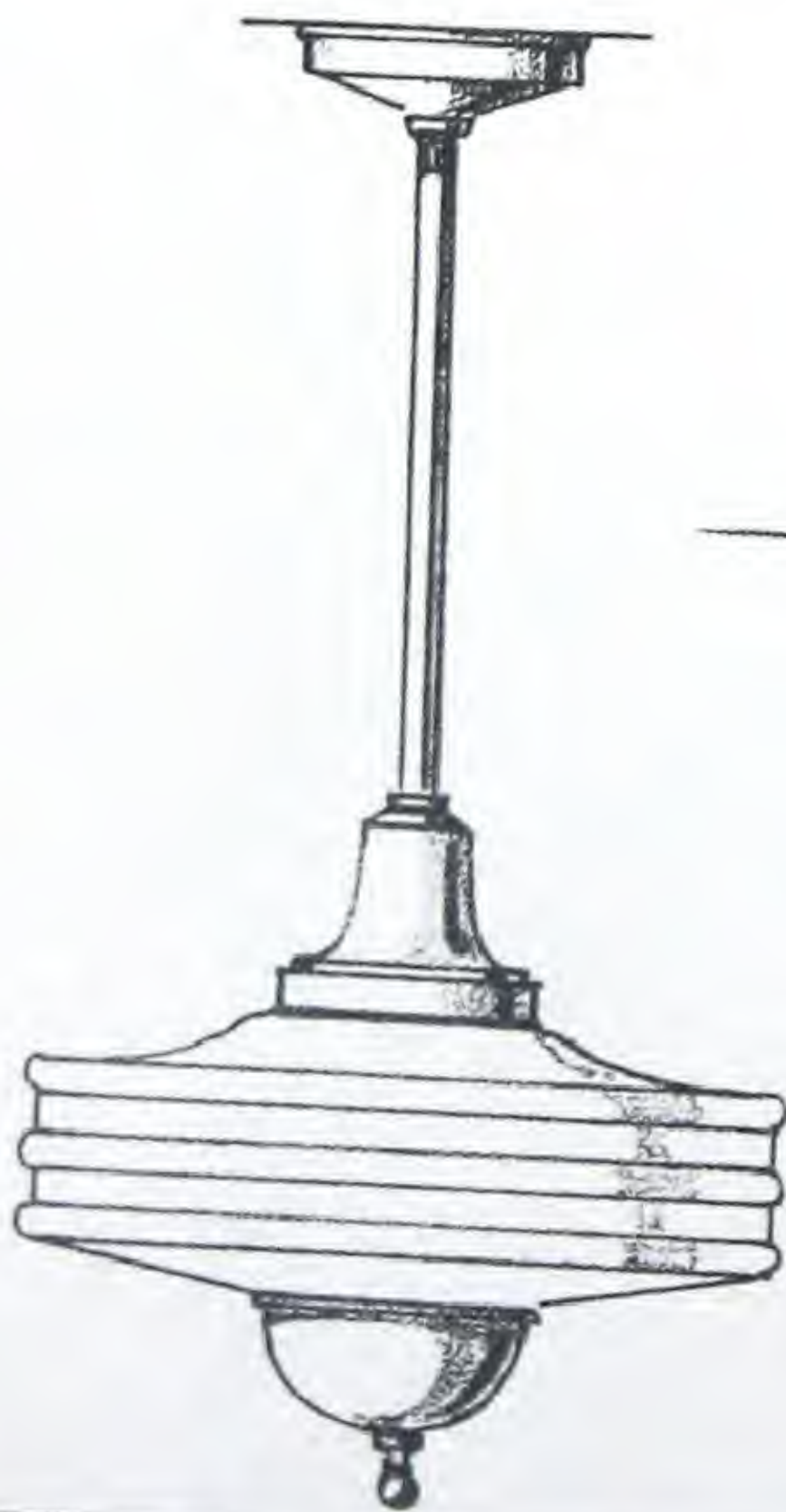
Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.	*Lamp position, in.	Recommended wattage
5649	Monax	8	6 1/16	4	1 1/2	100
5652	Monax	10	7 5/8	4	1 1/2	100
5653	Monax	12	9	6	2	150
5653A	Monax	12	9	4	1 1/2	150
5651	Monax	14	10 3/16	6	2	200
5654	Monax	16	11 1/2	6	2	300

*Lamp position—Represents the distance in inches of the lamp contact above the plane of the fitter screws in the fixture.



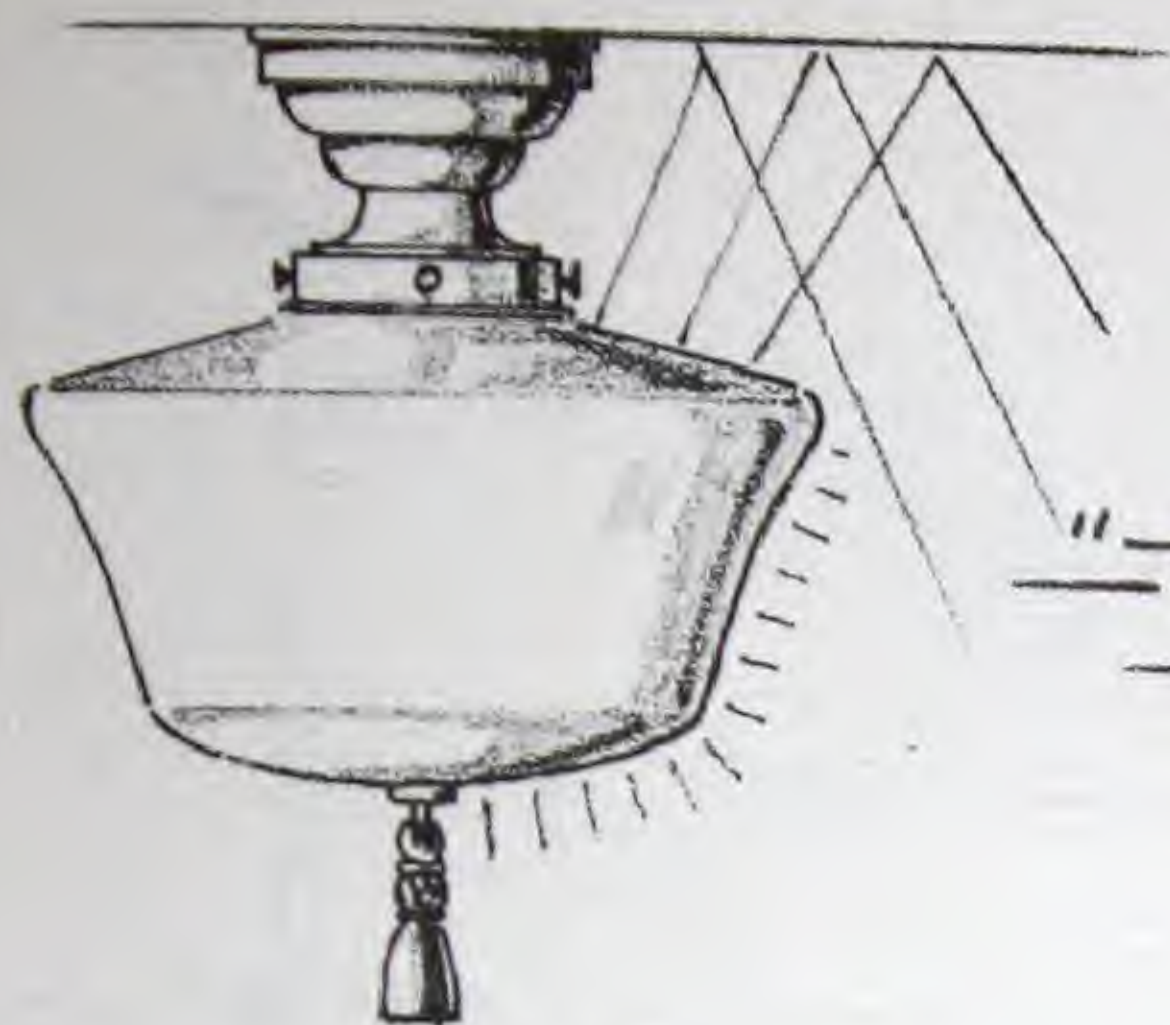
— FOR - LOW - CEILINGS —

— "THE-SILVAX" —
— MONAX —



Mould Number	Glass	Diam. Inches	Depth Inches	Fitter Diam. Inches	Lamp position distance in inches of cap contact of lamp from plane of fitter screws	Recommended Wattages
12031	Monax	10	5 13/16	4	3" above	100
12032	Monax	12	5 13/16	4	3" above	150
12033	Monax	14	6 7/8	6	3" above	200
12034	Monax	16	7 11/16	6	3 1/2" above	300
12035	Monax	18	9 3/16	6	3" above	500

— STORE LIGHTING— GENERAL MERCHADISE —



— "THE ROMANESQUE"
— SEMI-INDIRECT —
— GALAX —

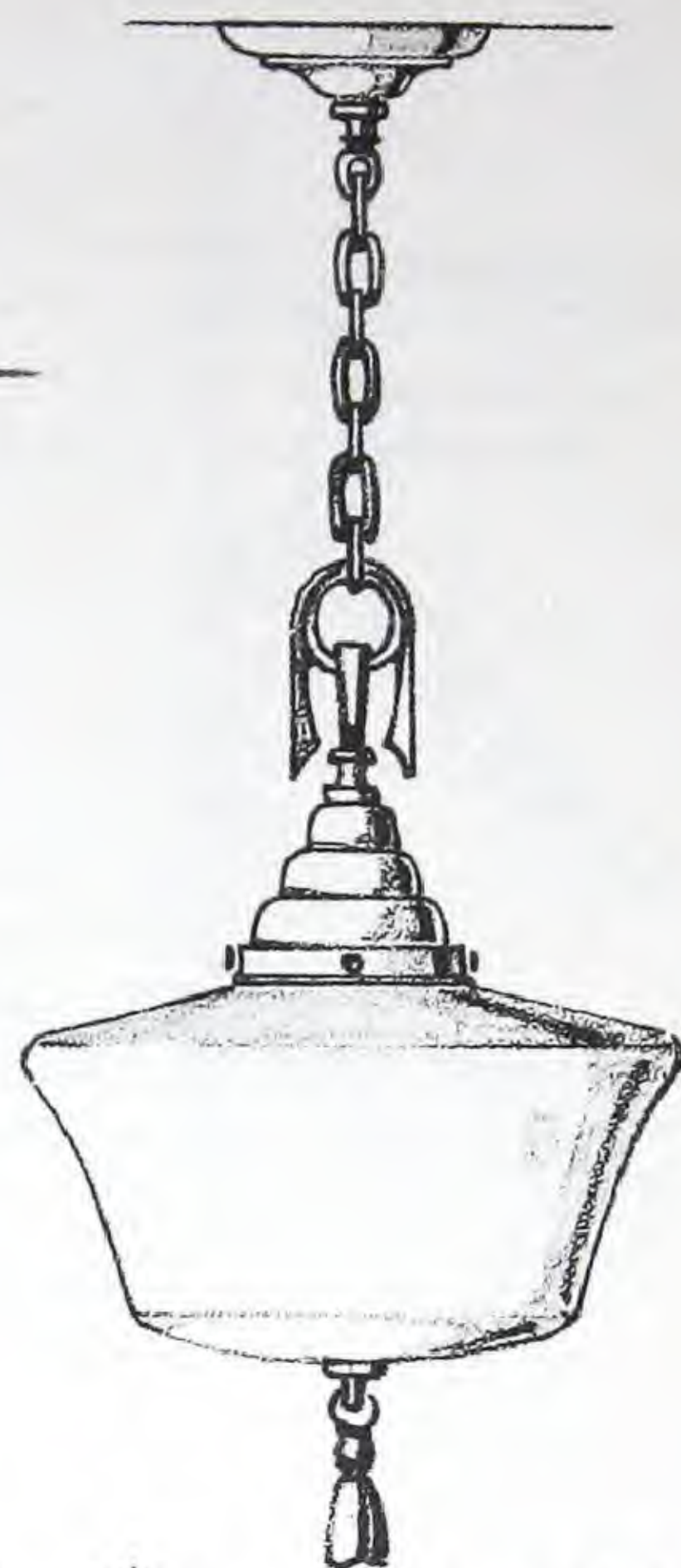
— FOR - LOW - CEILINGS —



PLAIN GLOBES

Mould Number	Description	Diam. Inches	Depth Inches	Fitter Diam. Inches	*Lamp Position Inches	Recommended Wattage
12009	Galax	10	7 7/16	4	1 1/2	100
12010	Galax	12	8 3/4	6	1 1/2	150
12011	Galax	14	10	6	1 1/2	200
12012	Galax	16	11 3/8	6	2	300
12014	Galax	18	12 1/2	6	2	500

*Lamp position—Represents the distance in inches of the lamp contact above the plane of the fitter screws in the fixture.



— FOR - HIGH - CEILINGS —

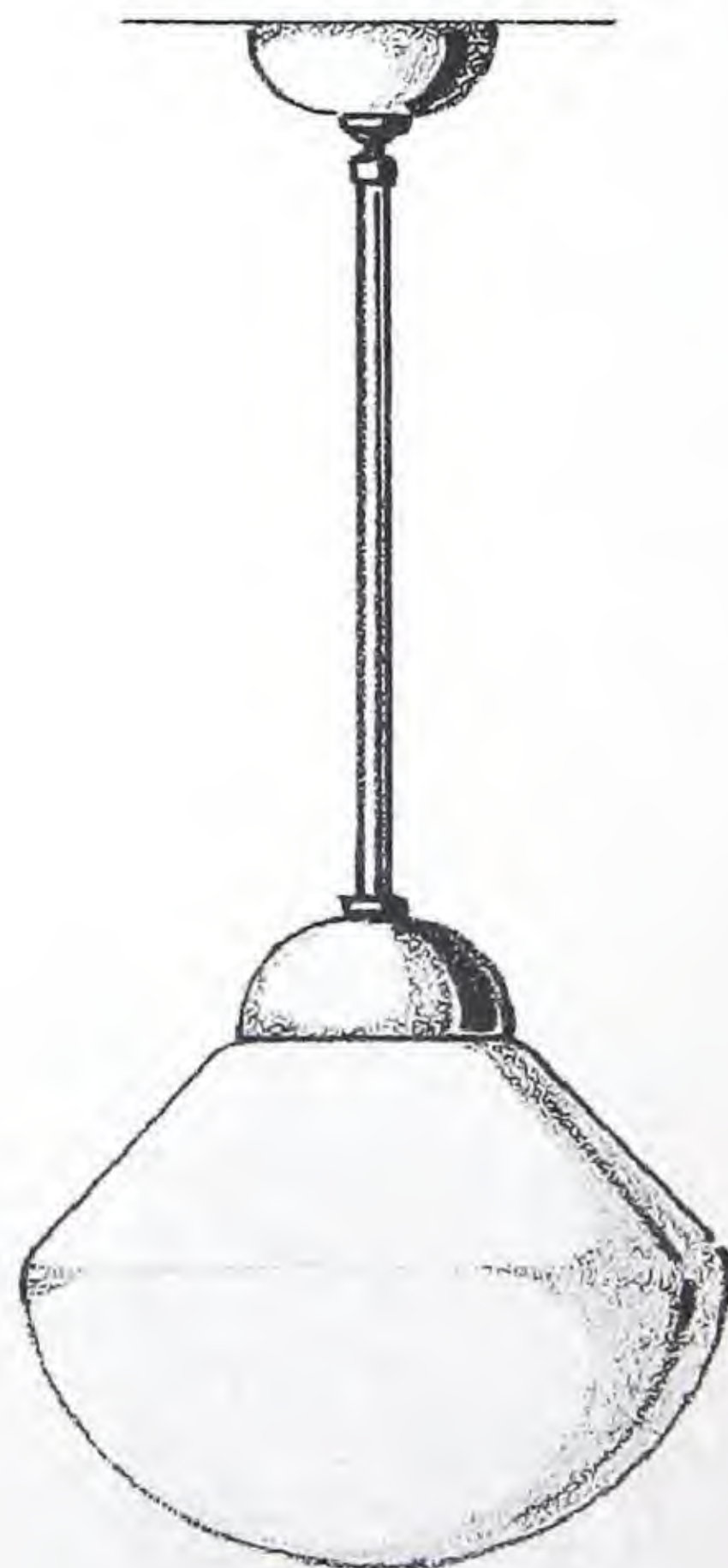


— "THE AIR-FLOW"
— MONAX —

— #12215 - 16" WIDE - 12 7/8 DEEP —

— CHIP-PROOF-TOP-OPENING - 5 3/4" - DIAMETER —

— USED-WITH-FLUSH-TYPE-INSIDE-HOLDER —



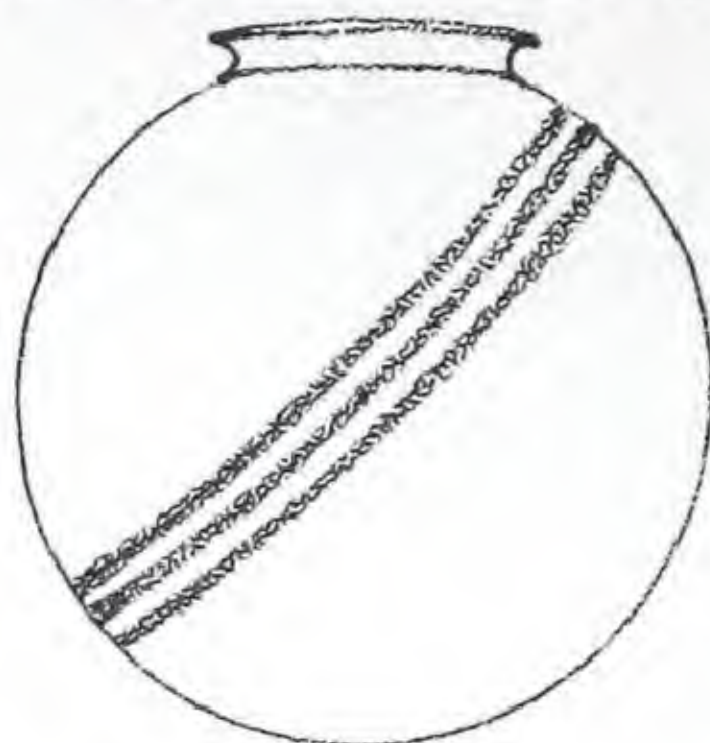
— CORNING GLASS WORKS —

— STORE LIGHTING — GENERAL MERCHANDISE —

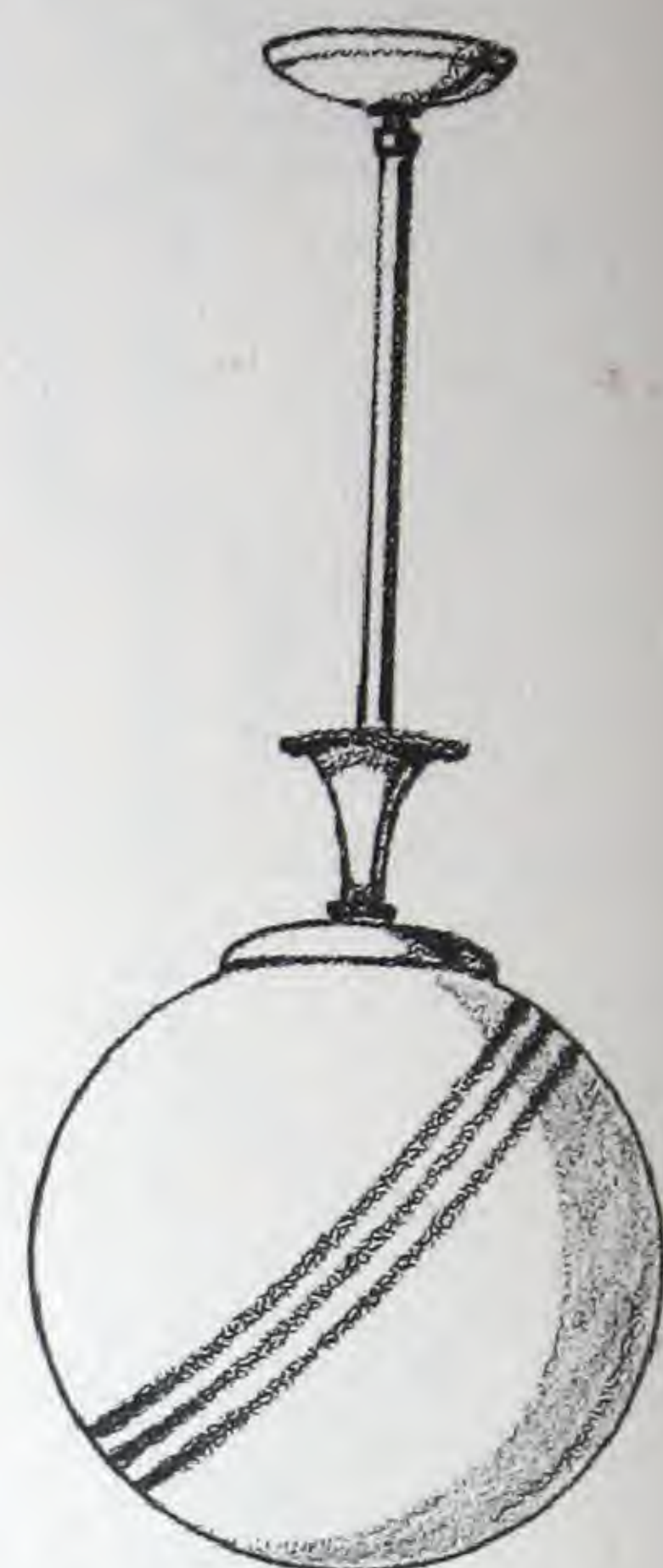


— FOR - LOW - CEILINGS —

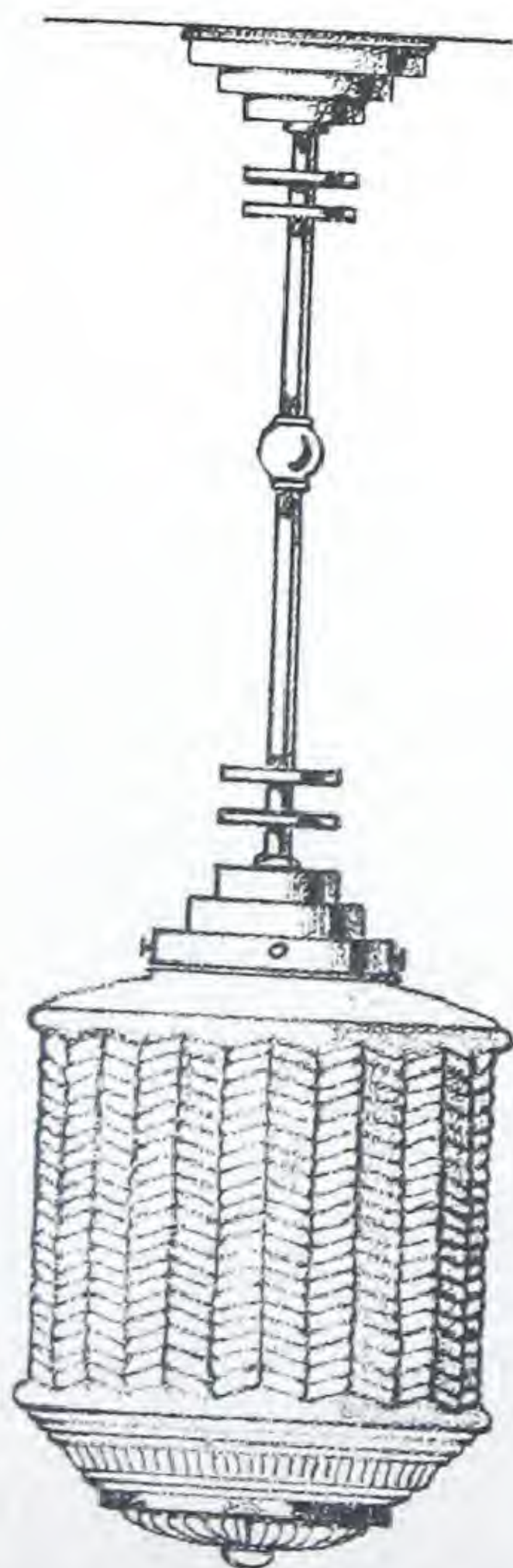
— "THE - BAL - MODERNE" —
— MONAX —
— WITH - SILVER - STRIPES —



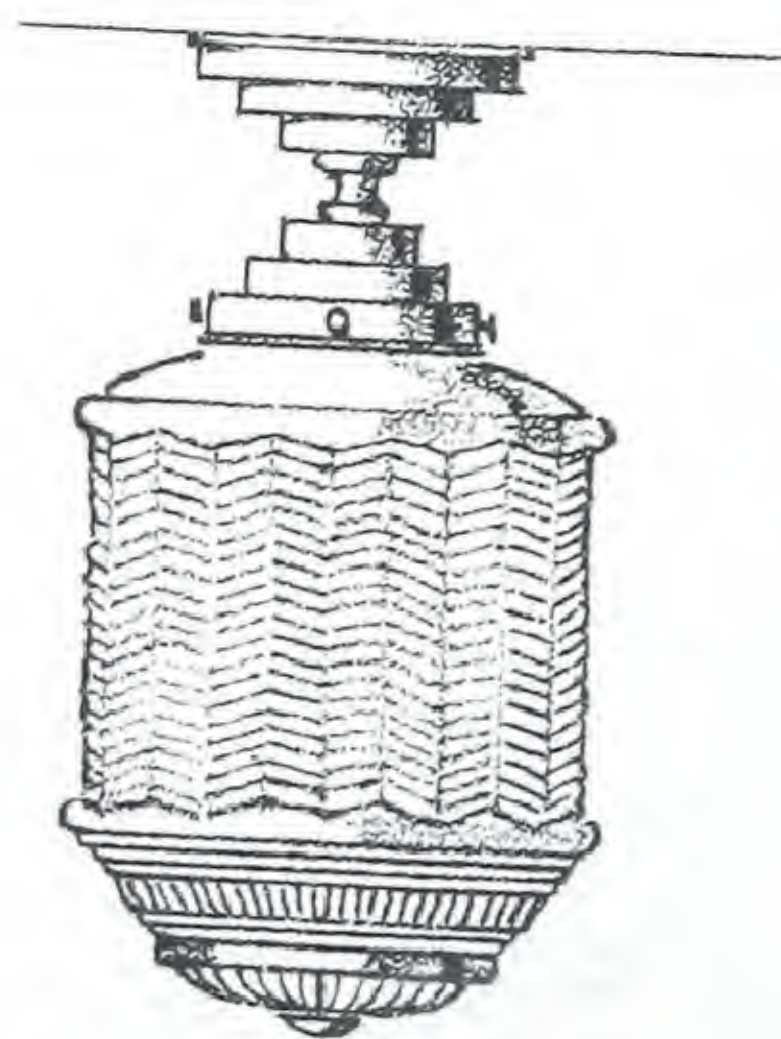
- | | | | |
|------|-------|----------|-----------|
| #832 | D 152 | 8" DIA. | 4" FITTER |
| #850 | D 152 | 10" DIA. | 4" FITTER |
| #838 | D 152 | 12" DIA. | 6" FITTER |
| #861 | D 152 | 14" DIA. | 6" FITTER |



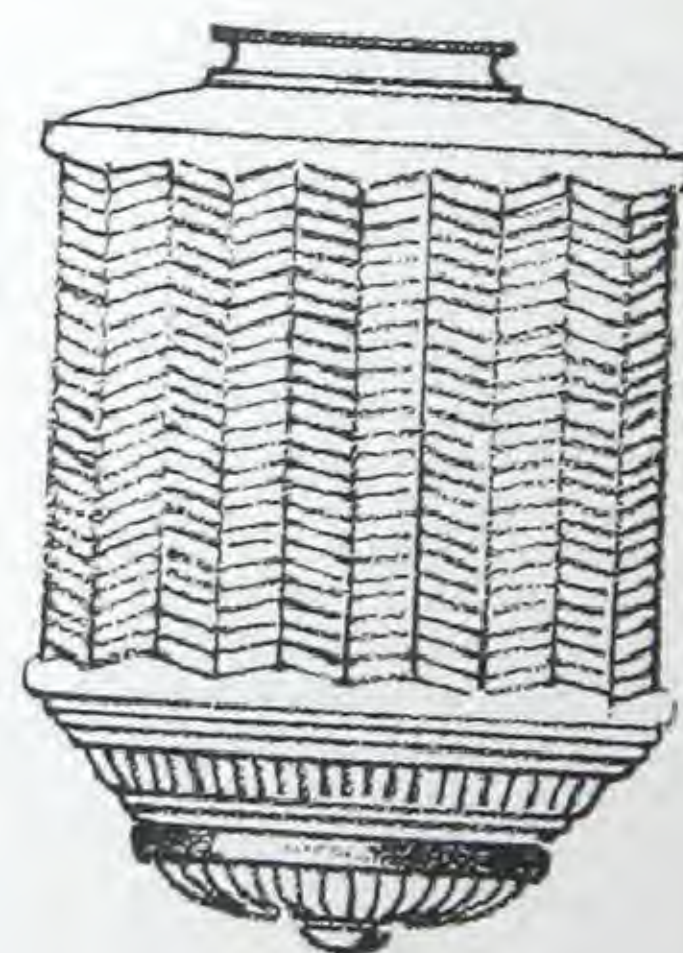
— FOR - HIGH - CEILINGS —



— FOR - HIGH - CEILINGS —



FOR LOW CEILINGS



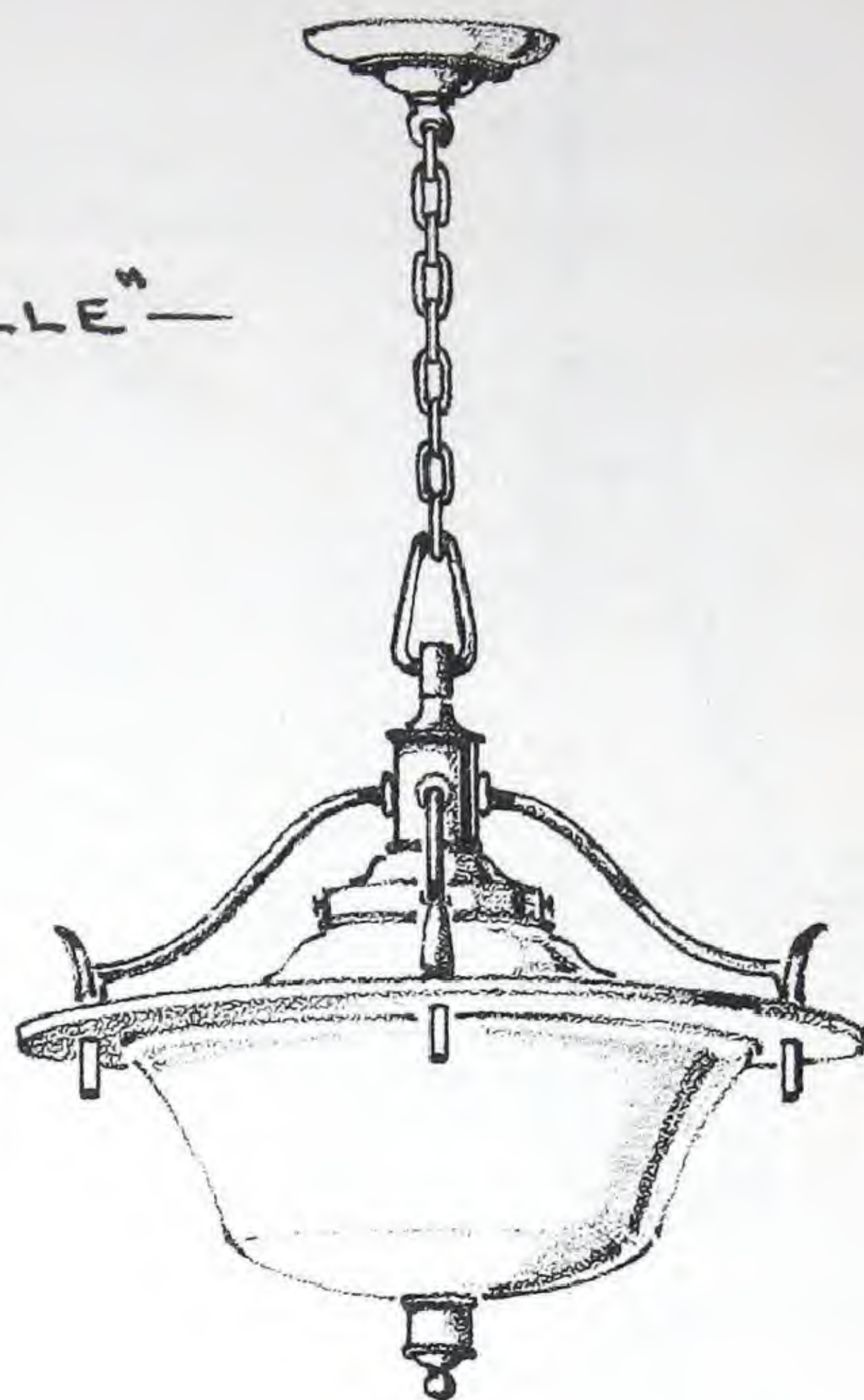
Mould No.	Description	Diameter Inches	Over-all Depth Inches	Fitter Diameter Inches
12021	Triple Lite Jr., Monax Assembly	9 7/16	10 3/4	6
12022	Triple Lite Sr., Monax Assembly	12	13 1/4	6

— LIGHTING- APPAREL STORES —

— SEMI-DIRECT —



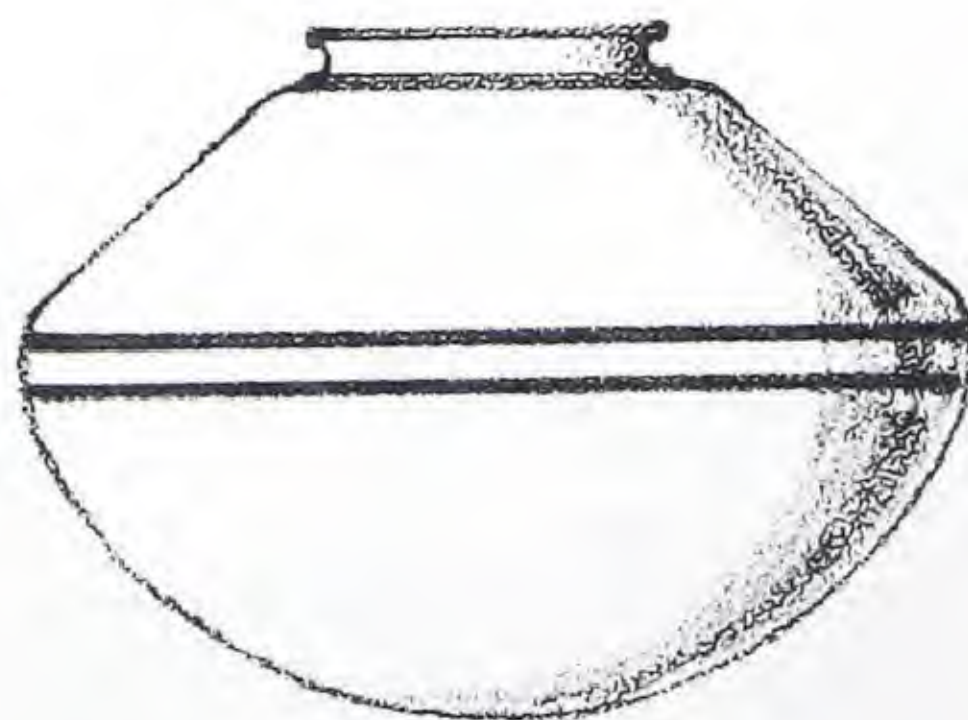
— "THE SEVILLE" —
— MONAX —



Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
5294-A	Monax	8 1/2	5 9/16	4
5340	Monax	9	6 1/2	4
5295	Monax	10	6 1/2	4
5296	Monax	12	7 3/4	6
5296-A	Monax	12	7 3/4	4
5297	Monax	14	9	6
5298	Monax	16	10 1/4	6
5645-A	Monax	18	11 3/8	6
5666	Monax	20	12 3/4	8

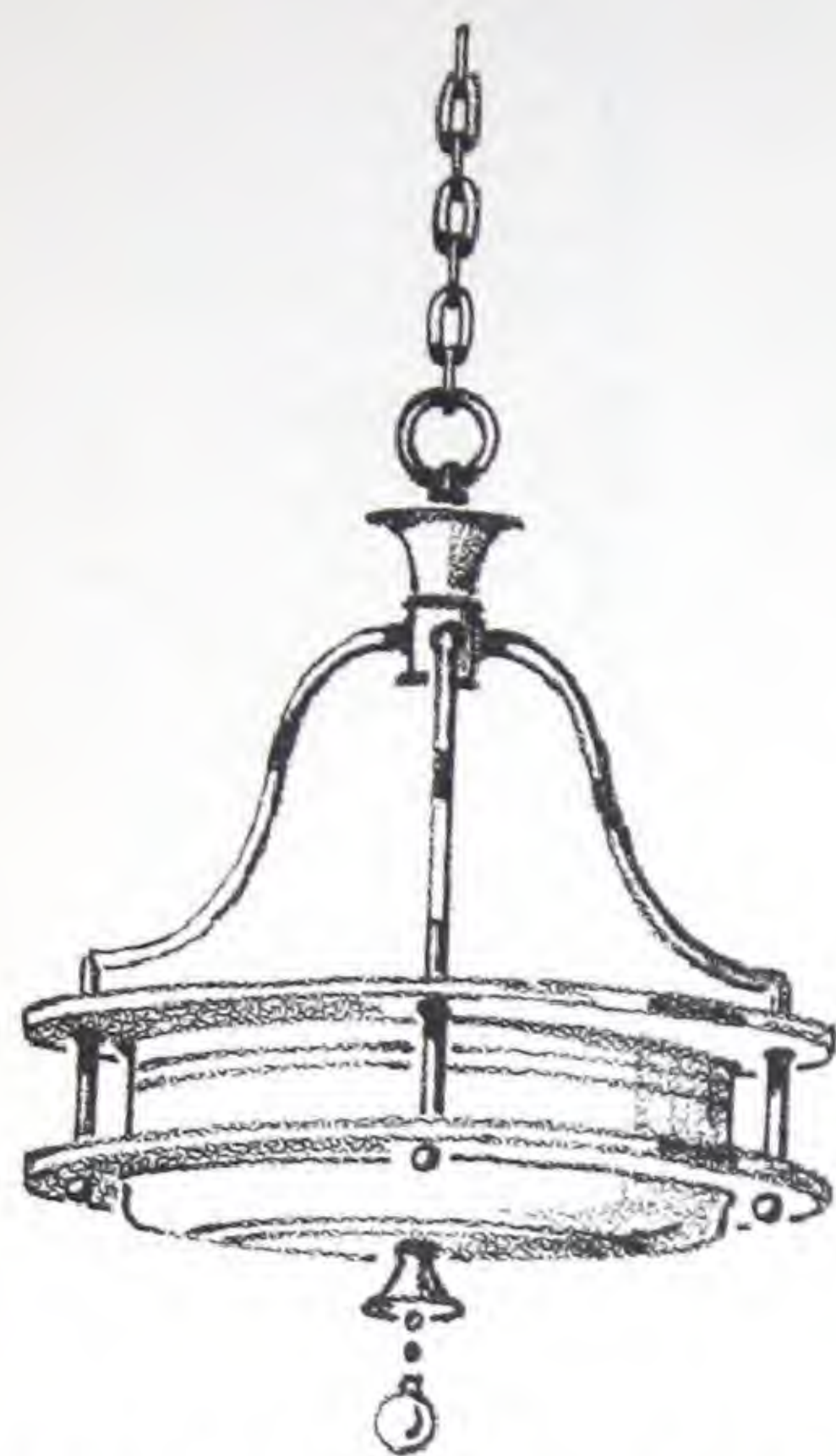


— "THE PILGRIM" —
— MONAX —
— BLACK-LINE-DECORATION —



Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
12300	D-121 Monax	8 7/16	7	4
12301	D-121 Monax	9 7/16	7 1/2	4
12302	D-121 Monax	10 7/16	8 5/16	4
12304	D-121 Monax	12	9 3/16	6
12305	D-121 Monax	14	10 1/2	6
12306	D-121 Monax	16	11 3/4	6
12307	D-121 Monax	18	13 3/16	6

— LIGHTING — APPAREL STORES —



— FOR HIGH CEILINGS —

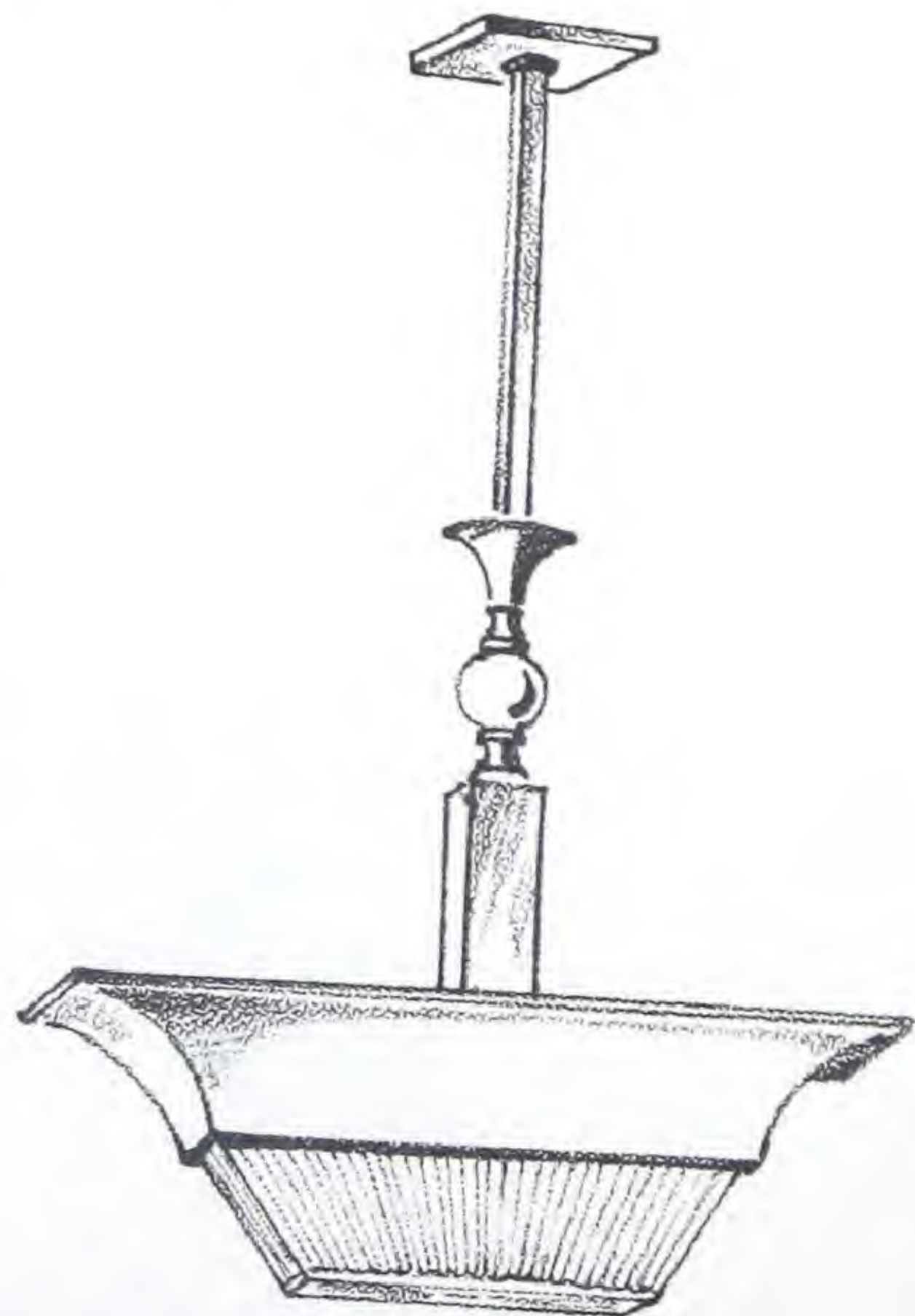


— FOR LOW CEILING —

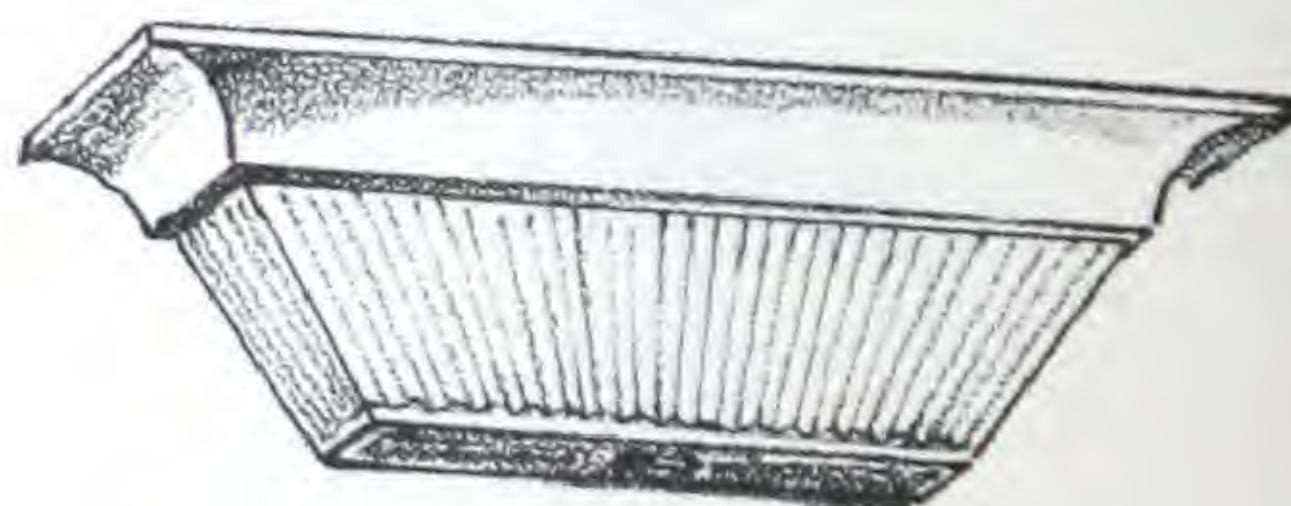


Monax Bowls decorated with tan tones, white lines around sides and bottom.

Mould No.	Description	Diameter, Inches	Depth, Inches
12192	D/183 Monax	8	3
12146	D/183 Monax	10	3 1/2
12147	D/183 Monax	12	4
12148	D/183 Monax	14	4 1/2
12195	D/183 Monax	16	5



— FOR HIGH CEILINGS —



— FOR LOW CEILINGS —



Square Bowls of "Lumite"
{Crystal} Glass

Supplied either plain or tinted pastel green, pink or ivory satin. Please specify the color desired.

Mould No. 12112 —

8 15/16 inches square.

2 11/16 inches deep.

— LIGHTING - APPAREL STORES —

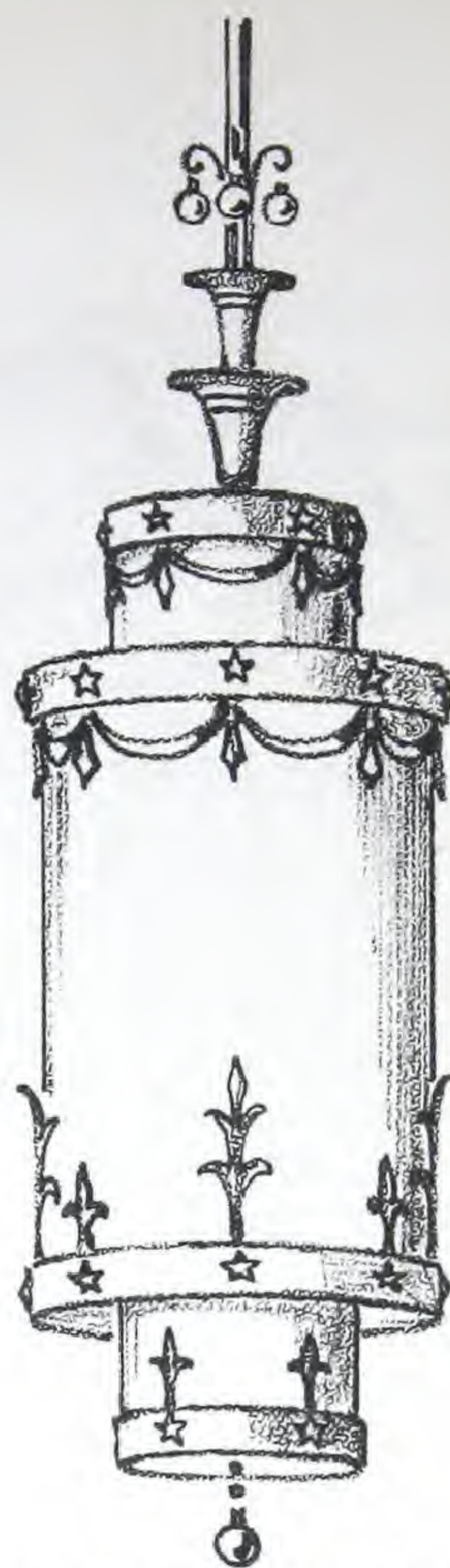


— MONAX: CYLINDERS —

DIA. — MAX. LENGTH

2"	21"
2½"	14"
3"	18"
3½"	14"
4"	19"
4½"	32"
5"	16"
6"	21"
7"	16"
8"	26"
10"	18"
12"	36"
13⅝"	28"

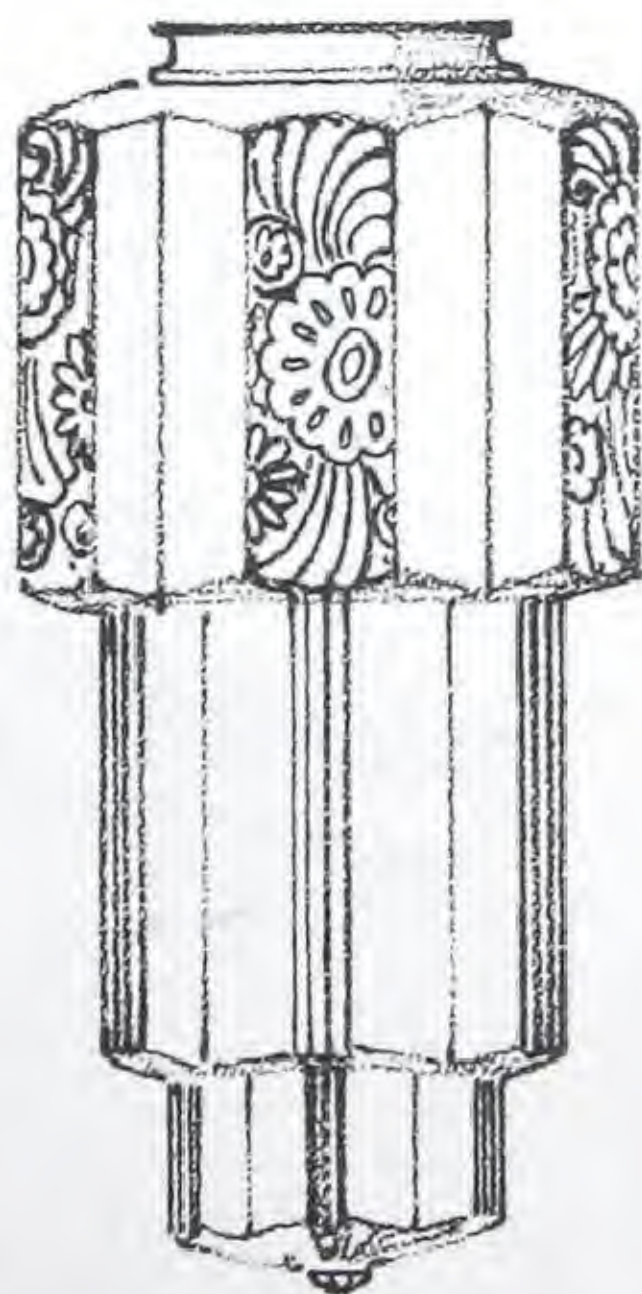
— A. SINGLE - CYLINDER —
— OPEN - TOP - AND - BOTTOM —



— A. COMBINATION - OF - TWO —
— SIZES - OF - CYLINDERS —



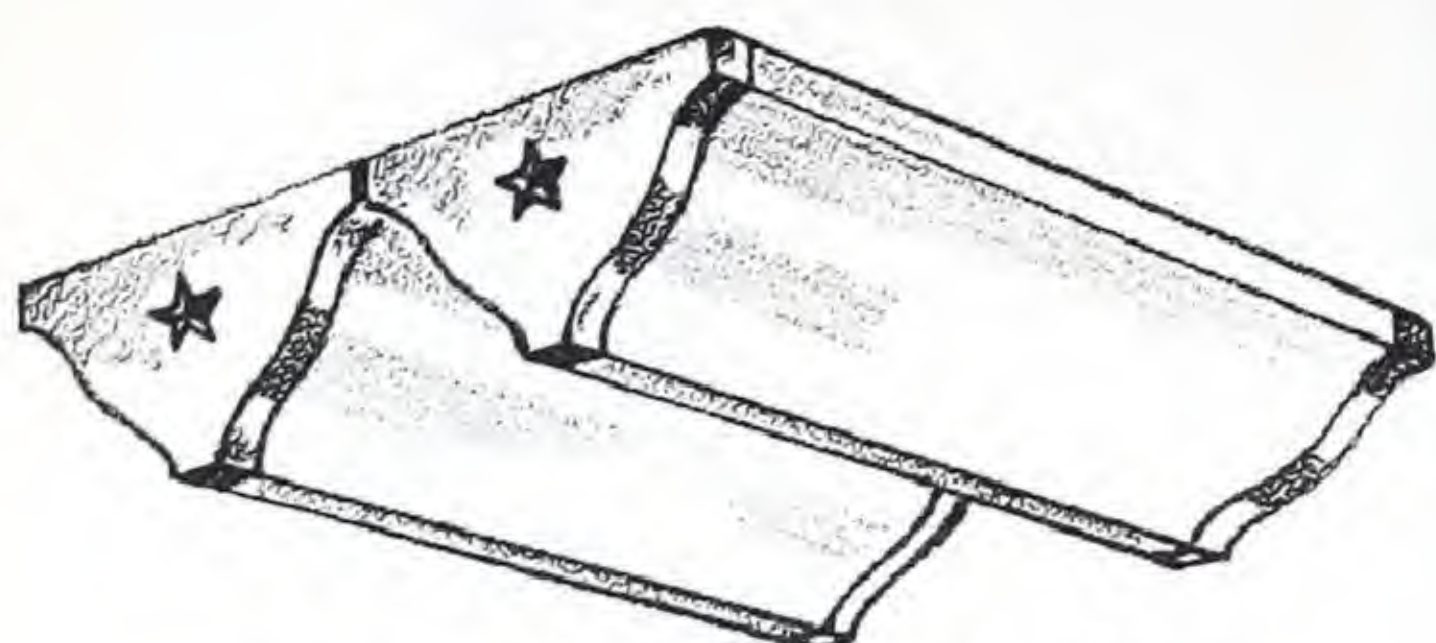
— "THE-MODERNISTIC" — — MONAX —



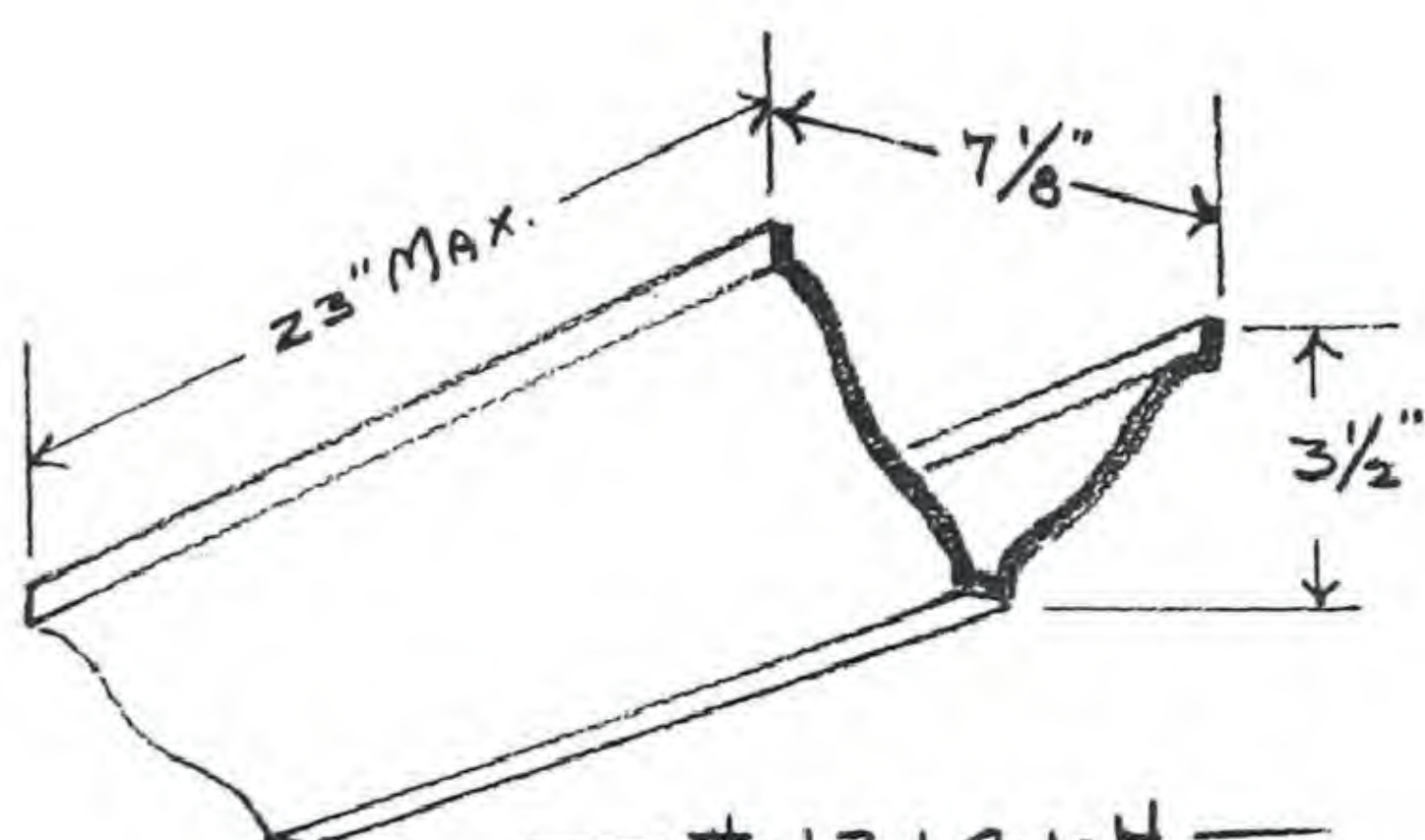
- #5658 - 6" DIA. - 9⅛" LONG - 4" FITTER
- #5695 - 8⅛" DIA. - 13½" LONG - 6" FITTER
- #5680 - 10" DIA. - 16⅜" LONG - 6" FITTER
- #5696 - 12" DIA. - 20" LONG - 8" FITTER
- #5697 - 16" DIA. - 27" LONG - 12" FITTER

— CORNING - GLASS - WORKS —

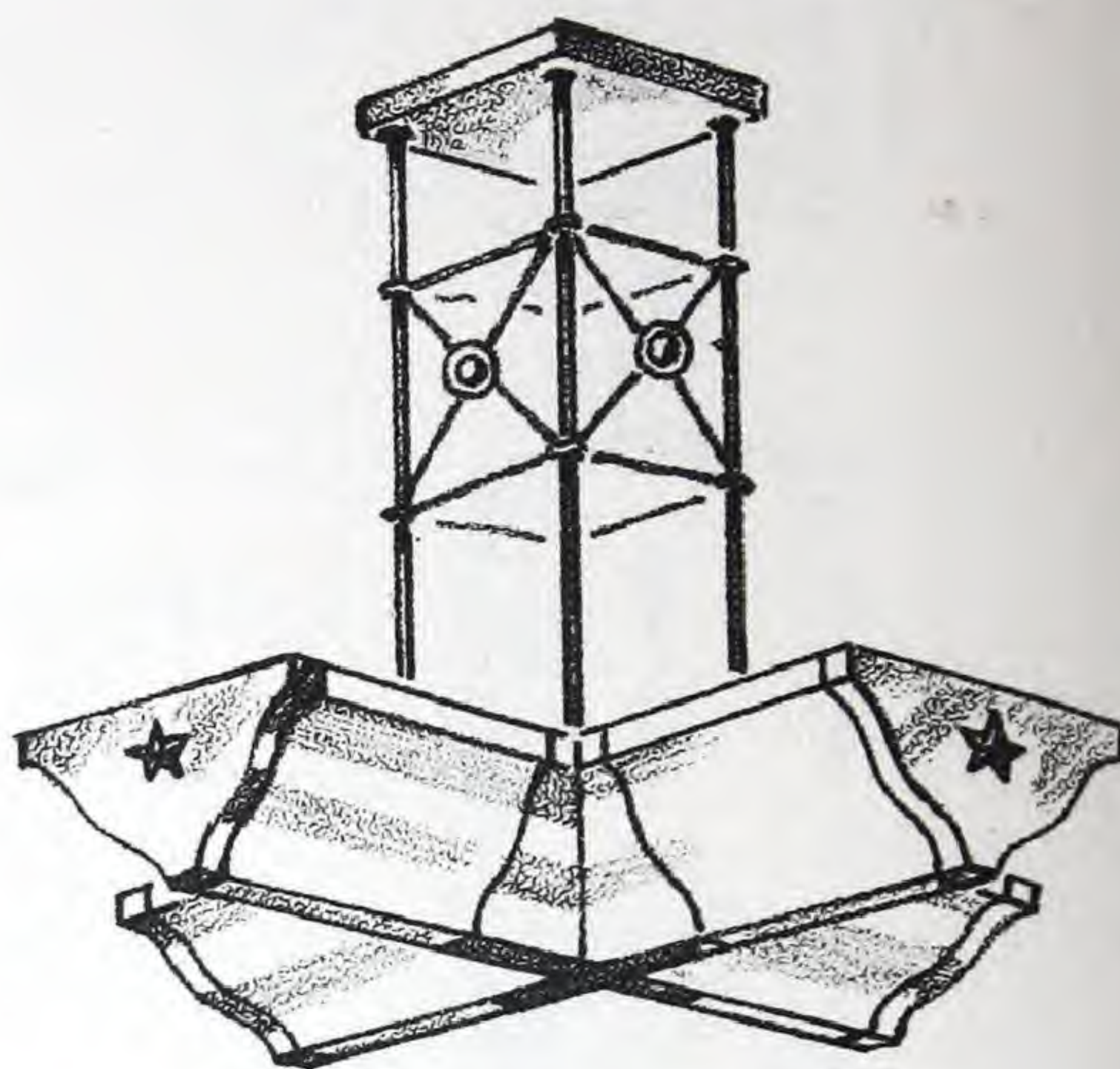
— LIGHTING—APPAREL STORES —



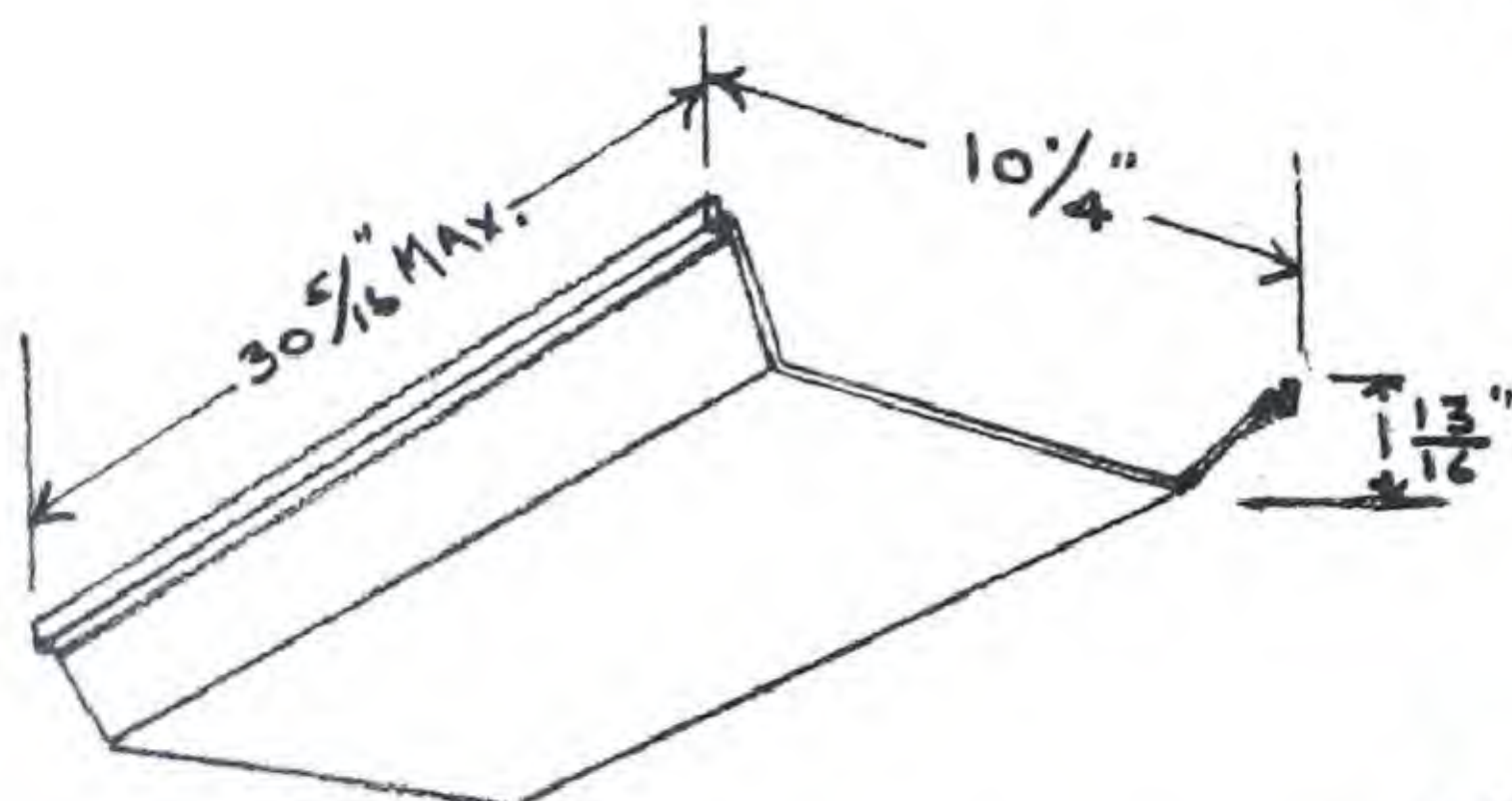
— FOR - LOW - CEILING —



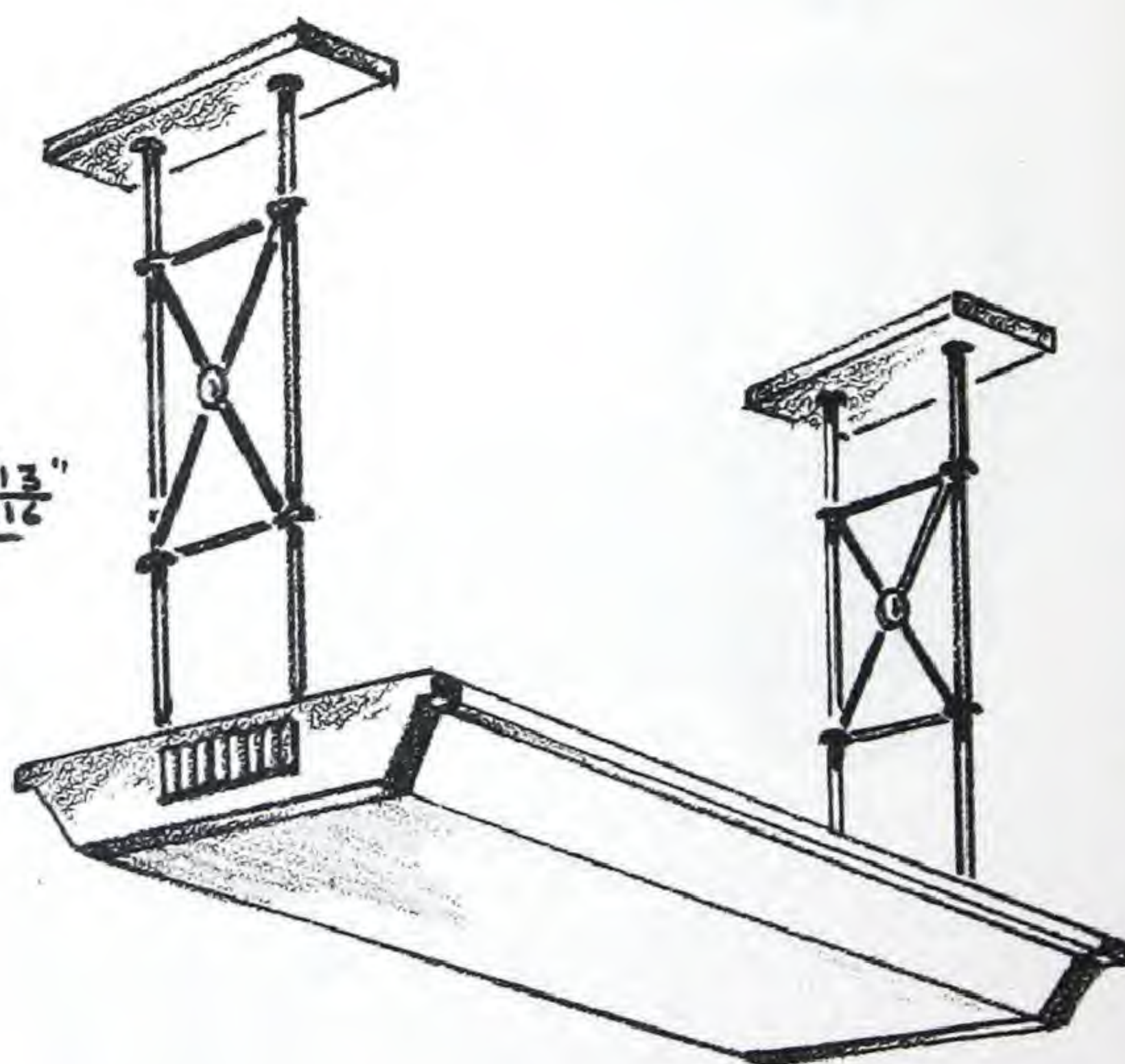
— # 12141 - H —
— MONAX - TROUGH - STRIP —



— FOR - HIGHER - CEILINGS —



— # 12151 - MONAX - TROUGH -
— STRIP —



Office Lighting

The average age of lighting of office building is about 18 years. Many of them still use the luminaires originally installed despite the advancement made in lighting practice during recent years. The competition of newer buildings with modern and more efficient illumination necessitates relighting the older buildings if they are to maintain a profitable occupancy.

An office manager may be misled into false economy by reducing lighting cost. Such a reduction often causes insufficient illumination which decreases office efficiency. In the final analysis, losses through inefficiency more than offset new savings in reduced current cost. Instead of an arbitrary change the office manager should analyze his particular problem giving due weight to all factors involved in its cost. Annual renting rate per square foot of office space usually runs between one and four dollars - average two dollars. Present lighting costs average five cents per square foot, or two and one-half percent of the rental. Rent ranges from ten to twenty percent of the total office expense. Present lighting costs range from a quarter to one-half of one percent of the total office expense (salaries, rent, office supplies, telephone, etc), yet illumination affects every phase of office operating efficiency. Doubling the illumination would increase the office expense only a quarter to one-half of one percent and would pay for itself ten times over through increased efficiency.

The cost of office lighting can be divided into two phases, the initial cost of the lighting equipment and the cost of maintenance. Of the two, the latter is by far the more important since it is continuous. Maintenance includes the costs of current, lamp replacements and cleaning. Failure to keep a lighting fixture clean is costly. A layer of dirt often absorbs as much as 50% of the light. Glass is easily cleaned and restored to its original lighting performance. Therefore, the office manager can afford to purchase the most efficient luminaire available.

MONAX glass is recognized as highly efficient for semi-direct, GALAX for semi-indirect and DENAX for luminous indirect lighting. Globes made from these glasses will provide highly efficient office lighting.

The type of lighting required for any office depends upon the character of work carried on in the office. We recommend semi-direct lighting for offices which have dark ceilings, are in a locality where dirt and dust collects more rapidly, and for corridors, wash rooms, etc. We recommend either semi-indirect or luminous-indirect lighting for offices with white or very light colored ceilings and where the visual task is

severe. Any local lighting should supplement and not replace the general illumination.

Simplified Illumination Calculation Procedure

First - Determine foot-candles required from Table 1.

Second - Determine "Conditions Factor" for the interior whether "Favorable", "Average" or "Unfavorable". The "Conditions Factor" will depend upon the room proportions, color of ceiling and upper walls, and the maintenance of equipment. Typical "Average Conditions Factor" consists of -

Room proportions	
Width approximately twice ceiling height	
Color of Ceiling and walls	- Medium
Maintenance of equipment	- Fair

The "Conditions Factor" becomes more "Favorable" as the width of the interior increases in proportion to its height; as the color of ceiling and upper walls becomes lighter; and as the maintenance of equipment improves.

Third - Decide which type of illuminating glassware (Monax, Galax or Denax) is desired.

Fourth - Decide mounting height. Ordinarily, an overall fixture length (ceiling to underside of enclosing globe) of one-fourth ceiling height may be used. Ceiling type fitters should be used on low ceilings.

Fifth - Locate in first column, Table 2, the contemplated "Area Per Outlet" or "Approximate Spacing" and further narrow this down to the "Conditions Factor" determined in second step. Then traverse Table 2 horizontally to the right until the desired foot-candle intensity (as determined in first step) is located in the correct glassware section. If not so found, then go to a closer spacing until desired foot-candle intensity is located. Directly above in the column heading is the required lamp size.

Table 1

Recommended Standards for Good Illumination for Office Seeing Tasks

	Foot Candle Units of Light
Bookkeeping and Accounting	
Conference Rooms (General Meetings)	30
Corridors and Stairways	10
Desk Work (Ordinary)	5
Desk Work (Small Print)	20
	30

Table 1 (Continued)

	Foot Candle Units of Light
Rough Drawing and Sketching	30
Filing and Index Reference	20
Mail Sorting	20
Reception Rooms	10
Vault Interiors	10
Business Machines (Very Close Work) - Use Supplementary Local Lighting	50-100
Fine Sketching and Drafting	30-50
Stenographic Work (Prolonged Reading Shorthand Notes)	30-50

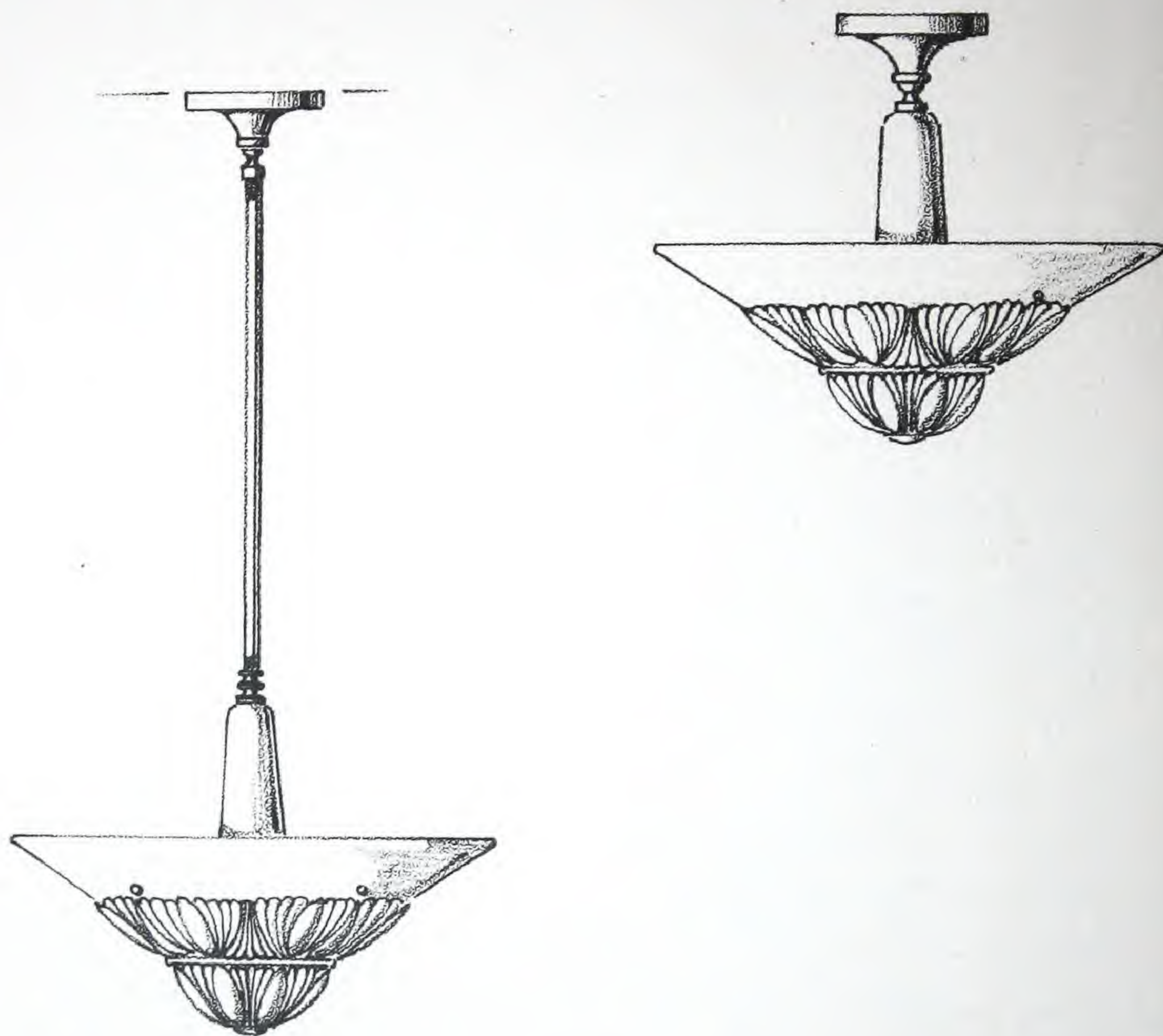
The following pages illustrate globes for office illumination.

TABLE 2
AVERAGE FOOT CANDLES

Area Per Outlet or Approximate Spacing	Condition or Room for Good Lighting	MONAX				GALAX				DENAX				
		Semi-Direct Lighting				Semi-Indirect Lighting				Luminous Indirect Lighting				
		150	200	300	500	150	200	300	500	16" Bowl	18" Bowl	22"	22"	22"
		Lamp 12"	Lamp 14"	Lamp 16"	Lamp 18"	Lamp 12"	Lamp 14"	Lamp 16"	Lamp 18"	Watt Lamp	Watt Lamp	Watt Lamp	Watt Lamp	Watt Lamp
55-65 Sq Ft or 7-3/4' x 7-3/4'	Favorable	13-18	18-24			10-14	15-22	22-30		10-14	15-22	22-30		
Spacing	Average	9-13	12-17			6-10	10-15	14-22		6-10	10-15	14-22		
65-75 Sq Ft or 8-1/2' x 8-1/2'	Unfavorable	6-8	9-11			4-6	6-9	10-14		4-6	6-9	10-14		
75-85 Sq Ft or 9' x 9'	Favorable	12-16	16-21	24-34		9-13	13-18	19-27	34-45	9-13	13-18	19-27	34-45	50-67
Spacing	Average	8-11	11-15	16-24		5-9	8-12	12-19	22-34	5-9	8-12	12-19	22-34	33-50
85-95 Sq Ft or 9-1/2' x 9-1/2'	Unfavorable	5-7	8-10	10-16		3-5	5-7	8-12	14-22	3-5	5-7	8-12	14-22	21-33
95-110 Sq Ft or 10' x 10'	Favorable	10-13	14-18	22-29		8-11	11-16	18-24	29-41	8-11	11-16	18-24	29-41	43-59
Spacing	Average	7-9	9-13	15-22		5-8	7-10	12-18	18-28	5-8	7-10	12-18	18-28	27-43
110-125 Sq Ft or 11' x 11'	Unfavorable	4-7	6-8	9-15		3-5	5-6	9-12	13-18	3-5	5-6	9-12	13-18	19-27
125-145 Sq Ft or 11-1/2' x 11-1/2'	Favorable	9-12	12-16	19-27	31-43	7-10	10-14	16-22	25-36	7-10	10-14	16-22	25-36	37-50
Spacing	Average	6-8	8-11	13-18	20-31	5-7	6-9	11-16	16-24	5-7	6-9	11-16	16-24	24-37
145-170 Sq Ft or 12-1/2' x 12-1/2'	Unfavorable	4-6	5-7	8-12	13-20	3-4	4-5	7-11	10-15	3-4	4-5	7-11	10-15	16-24
170-200 Sq Ft or 13-1/2' x 13-1/2'	Favorable	8-10	10-14	17-23	29-37	6-9	9-12	15-20	23-33	6-9	9-12	15-20	23-33	34-46
Spacing	Average	6-8	7-9	11-16	20-28	4-6	6-8	9-14	15-23	4-6	6-8	9-14	15-23	22-34
200-230 Sq Ft or 14-3/4' x 14-3/4'	Unfavorable	3-5	4-6	7-10	13-20	2-4	3-5	6-9	9-14	2-4	3-5	6-9	9-14	15-22
230-260 Sq Ft or 15-1/2' x 15-1/2'	Favorable	7-9	9-12	15-20	25-34	5-7	8-11	13-18	20-30	5-7	8-11	13-18	20-30	30-40
Spacing	Average	4.5-6	6-8	9-14	18-24	4-5	5-7	9-12	13-20	4-5	5-7	9-12	13-20	19-30
260-300 Sq Ft or 16-3/4' x 16-3/4'	Unfavorable	3-4	4-6	6-9	11-17	2-4	3-5	6-9	9-12	2-4	3-5	6-9	9-12	13-19
300-340 Sq Ft or 18' x 18'	Favorable	5.5-8	8-11	13-17	22-30	5-6	7-9	11-16	18-26	5-6	7-9	11-16	18-26	25-34
Spacing	Average	4-5	5.5-7	8-12	14-21	3-5	4-6	7-10	12-18	3-5	4-6	7-10	12-18	16-25
340-390 Sq Ft or 19' x 19'	Unfavorable	4-5	5-8	8-12	9-14	2-4	3-5	6-9	8-11	2-3	3-5	6-9	8-11	12-16
390-440 Sq Ft or 20-1/2' x 20-1/2'	Favorable	5-6	7-10	10-15	19-25	3.5-5	6-8	9-13	17-24	3.5-5	6-7	9-13	17-24	22-30
Spacing	Average	3-4	5-7	7-10	13-18	2-3	3-5	6-9	11-17	2-3	3-5	6-9	11-17	13-22
440-500 Sq Ft or 21-3/4' x 21-3/4'	Unfavorable	3.5-5	5-7	8-12	9-14	2-3	3-5	6-9	7-11	2-3	3-5	6-9	7-11	9-13
	Favorable		6-8	9-12	17-22	750 W	5-6	8-11	14-19		5-6	8-11	14-19	18-25
	Average		4-6	6-9	11-16	Lamp 20"	3-4	5-8	9-14		3-4	5-8	9-14	12-18
	Unfavorable		3-4	4-6	7-10	Globe	2-3	3-5	6-9		2-3	3-5	6-9	8-12
	Favorable		5-6	8-11	14-20	18-23	4-5	7-10	12-16		4-5	7-10	12-16	15-23
	Average		3-5	5-8	9-13	11-16	3-4	4-7	8-12		3-4	4-7	8-12	10-15
	Unfavorable		2.5-3	3.5-5	6-9	7-10	2.0-3	3-4	5-8		2-3	3-4	5-8	7-10
	Favorable		4-5.5	7-10	12-17	15-21	3.5-4	6-8	10-14		3-4	6-8	10-14	15-21
	Average		3-4	5-7	9-11	10-15	3.0-3.5	4-6	7-10		2-3	4-6	7-10	9-14
	Unfavorable		2-3	3-5	6-8	7-10	2-4	4-7			2-4	4-7		6-9
	Favorable		3.5-5	6-8	11-15	13-18	3-4	5-7	9-12		2-4	5-7	9-12	12-18
	Average		3.0-3.5	4-5	7-10	8-13		3-5	5-8		3-5	5-8	9-12	
	Unfavorable		3-4	5-7	5-8			2-3	3-5		2-3	3-5	5-8	
	Favorable			5-7	10-13	12-14		4-6	8-11			4-6	8-11	10-14
	Average			3.5-4	6.5-9.5	7-11		3-4	5-8			3-4	5-8	7-10
	Unfavorable			2.5-3	4-6.5	4-7			3-5			3-5	4-7	
	Favorable			4-6	8-11	10-12		3.5-5	7-10			3.5-5	7-10	10-12
	Average			3-4	5.5-8	6-10		2-3	4-7			2-3	4-7	6-10
	Unfavorable			2-3	3.5-5	4-6			3-4				3-4	4-6
	Favorable			3.5-5.5	7-10	9-11		3-5	6-8			3-5	6-8	9-11
	Average			2.5-3.0	5-7	5-9		1-3	4-6			1-3	4-6	5-9
	Unfavorable				3-5	3-5			3-4				3-4	3-5
	Favorable			6-9	7-10			3-4	5-7			3-4	5-7	7-10
	Average			4-6	4-7				3-5				3-5	4-6
	Unfavorable			2.5-4	2-4				2-3				2-3	2-4

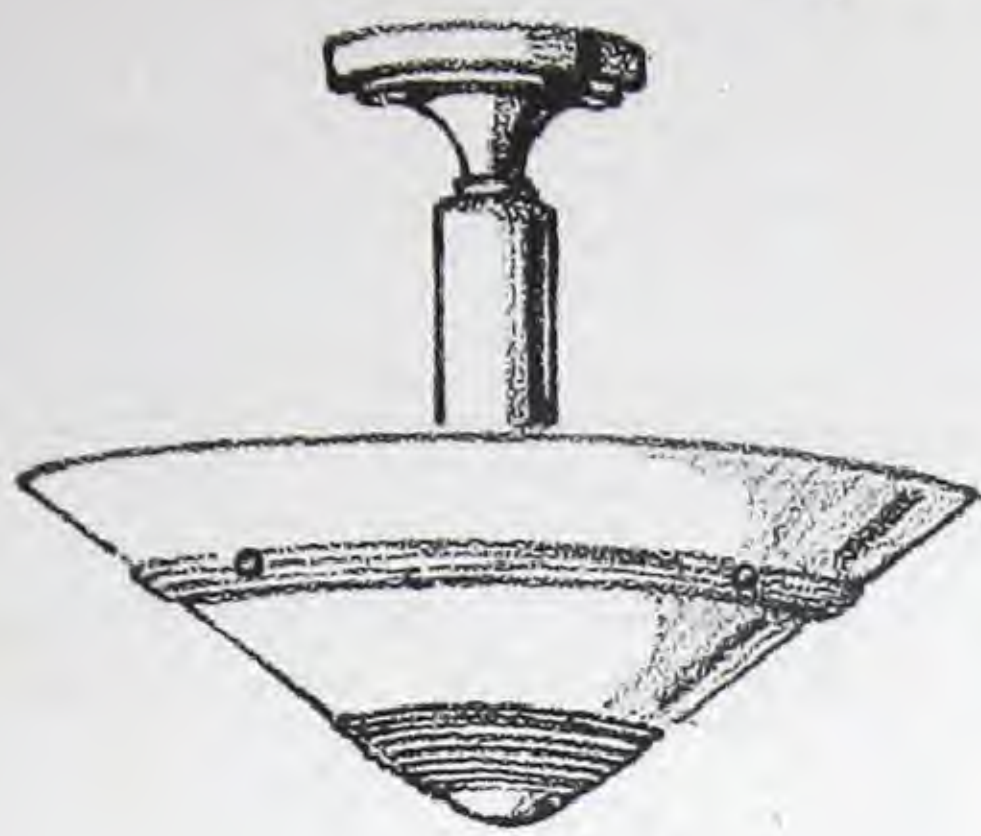
*Figures given are for MONAX Semi-Direct Lighting Decrease by 5% for GALAX Semi-Indirect Lighting

— OFFICE-LIGHTING —
— LUMINOUS-INDIRECT —
— THE-CAPITOL —
— DENAX-GLASS —

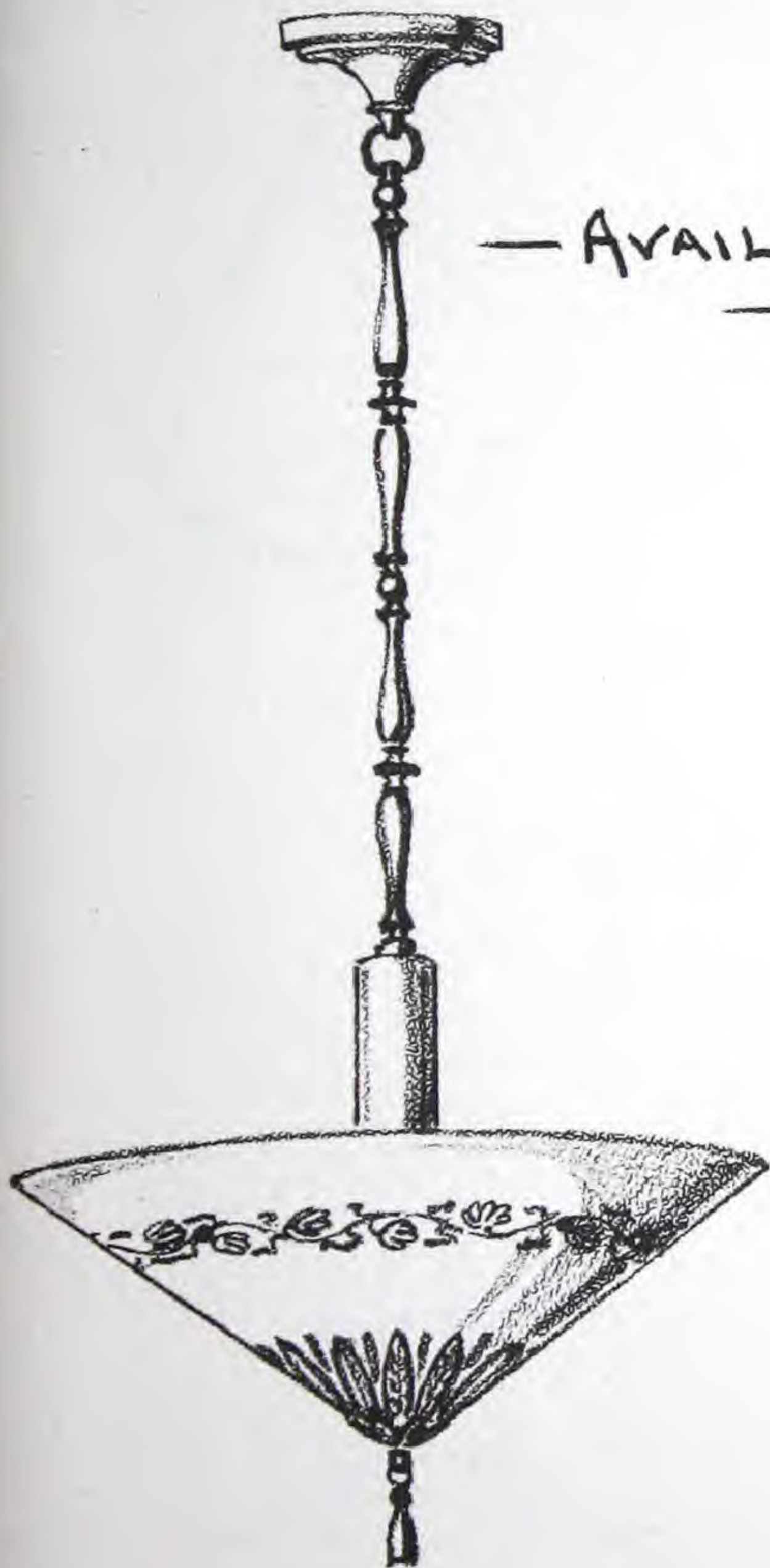
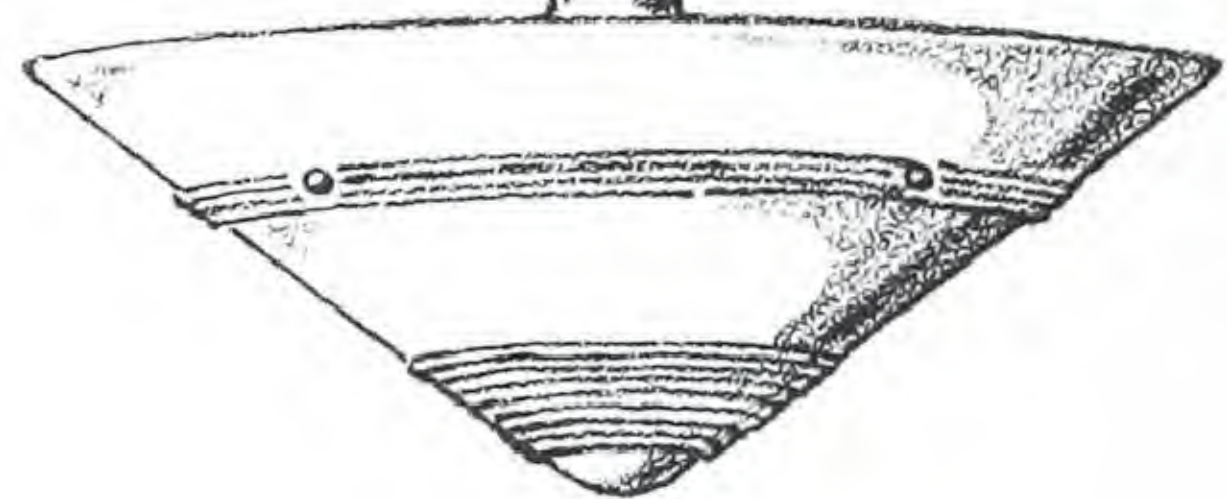


— PROPRIETARY-MOLD-AVAILABLE-THROUGH-THE —
— ART-METAL-COMPANY-AND-THEIR-DISTRIBUTORS —

— OFFICE - LIGHTING —
— LUMINOUS - INDIRECT —
— DENAX - GLASS —



— AVAILABLE - IN - ALL —
— SIZES —



— PROPRIETARY MOLD — AVAILABLE THROUGH WESTINGHOUSE —
— ELECTRIC & MANUFACTURING COMPANY AND THEIR —
— DISTRIBUTORS —

— CORNING - GLASS - WORKS —

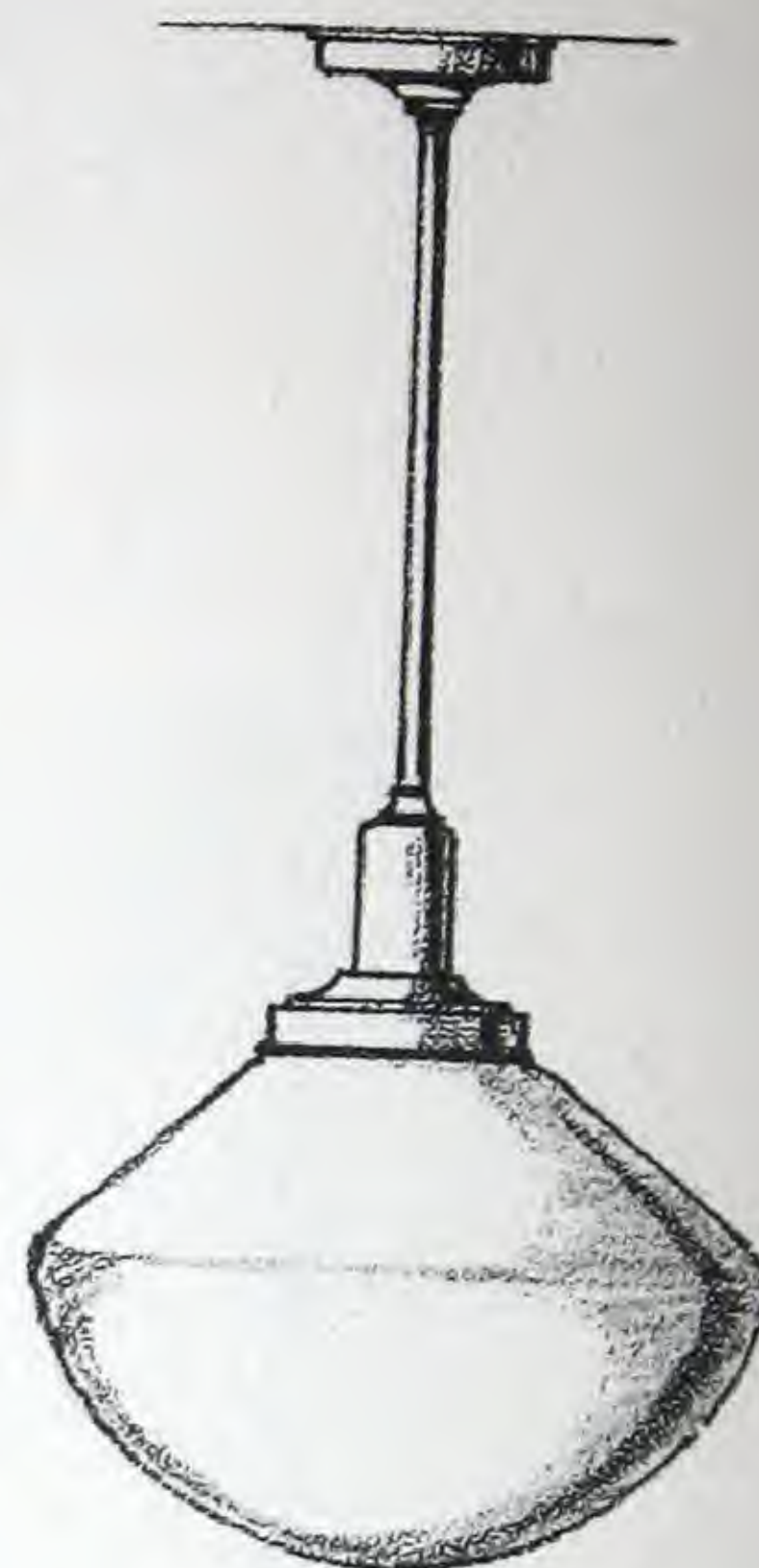
— OFFICE LIGHTING —

— SEMI-DIRECT —

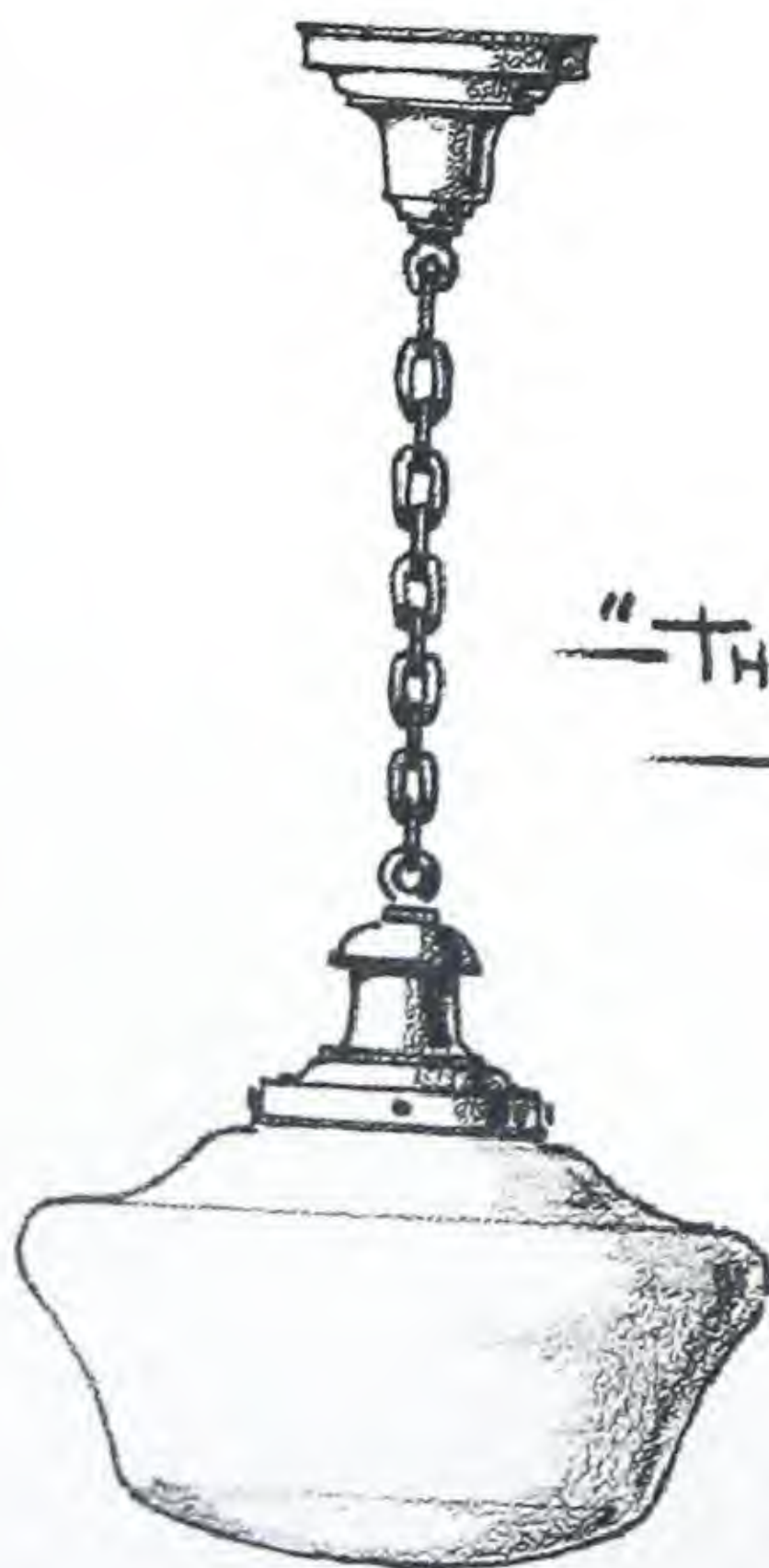


— "THE PILGRIM" —
— MONAX —

Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches	*Lamp Position Above, Inches
12300	Monax	8 7/16	7	4	1 1/2
12301	Monax	9 7/16	7 1/2	4	1 1/2
12302	Monax	10 7/16	8 5/16	4	2
12304	Monax	12	9 3/16	6	2
12305	Monax	14	10 1/2	6	2
12306	Monax	16	11 3/4	6	2
12307	Monax	18	13 3/16	6	3



— "THE SEVILLE" —
— MONAX —

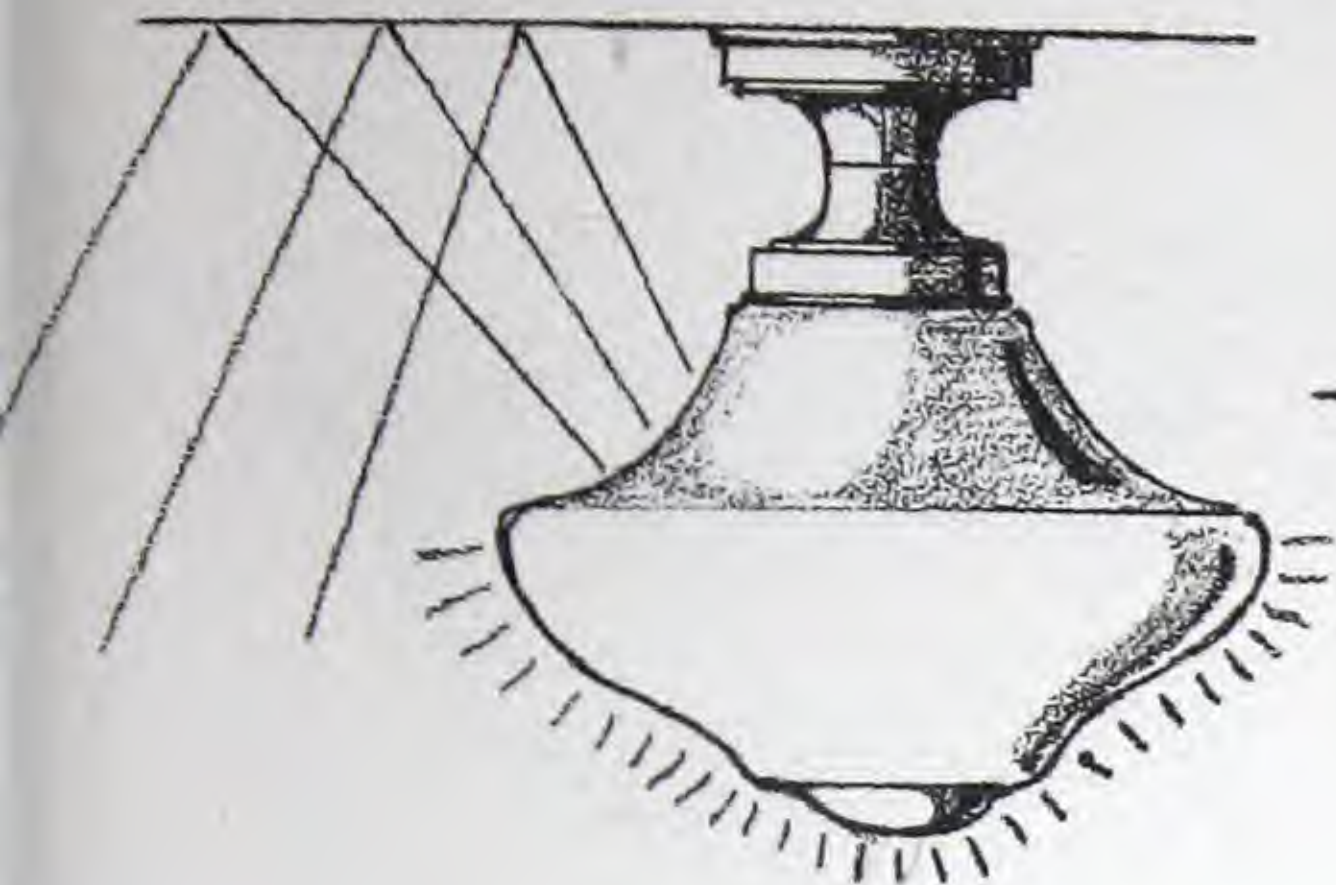


Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches	*Lamp Position Inches
5294-A	Monax	8 1/2	5 9/16	4	1 1/2
5340	Monax	9	6 1/2	4	1 1/2
5295	Monax	10	6 1/2	4	1 1/2
5296	Monax	12	7 3/4	6	2
5296-A	Monax	12	7 3/4	4	1 1/2
5297	Monax	14	9	6	2
5298	Monax	16	10 1/4	6	2
5645-A	Monax	18	11 3/8	6	3
5666	Monax	20	12 3/4	8	3

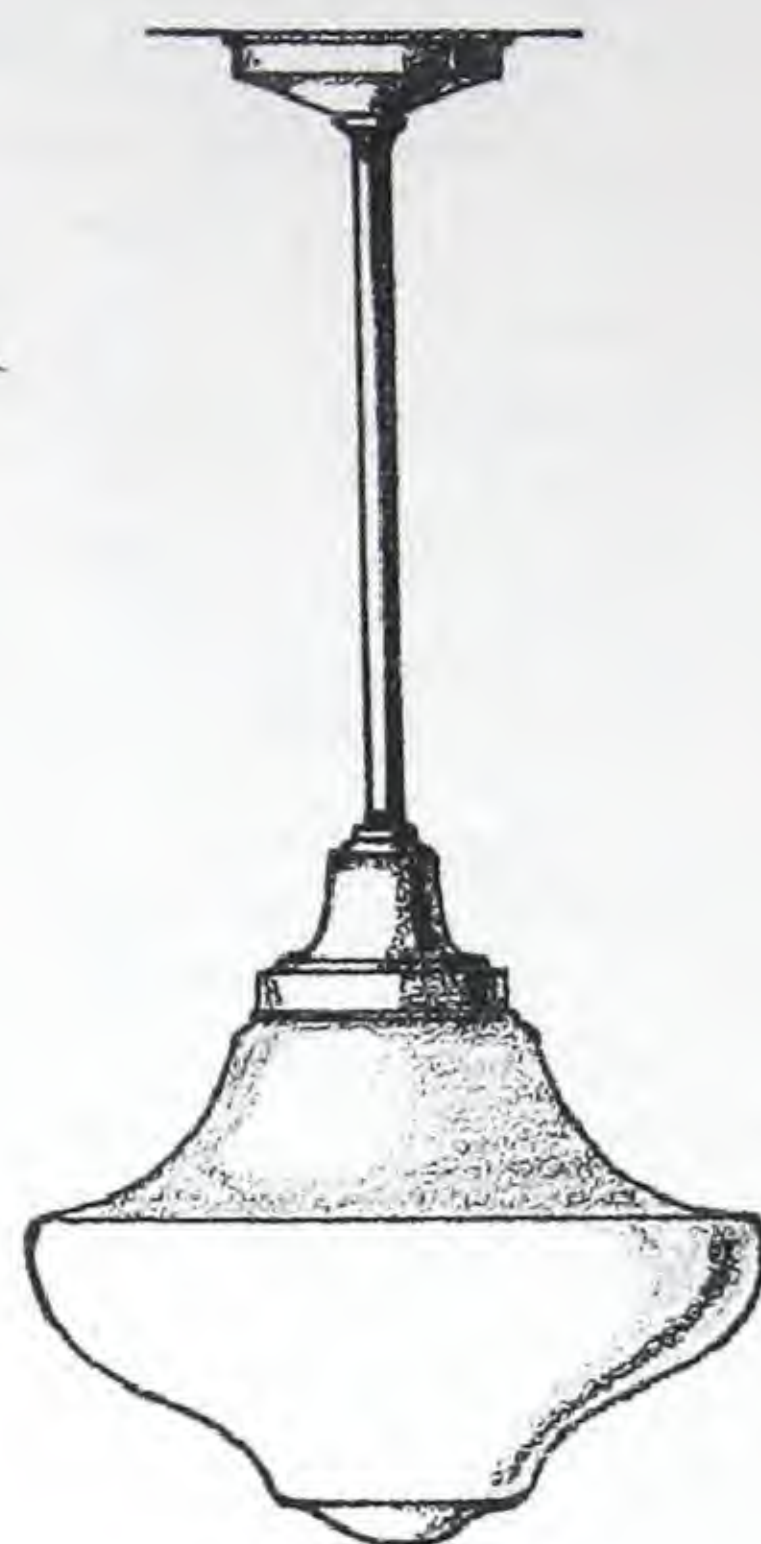
*Lamp position—Represents the distance in inches of lamp contact above the plane of fitter screws in the fixture.

—OFFICE-LIGHTING—

—SEMI-INDIRECT—



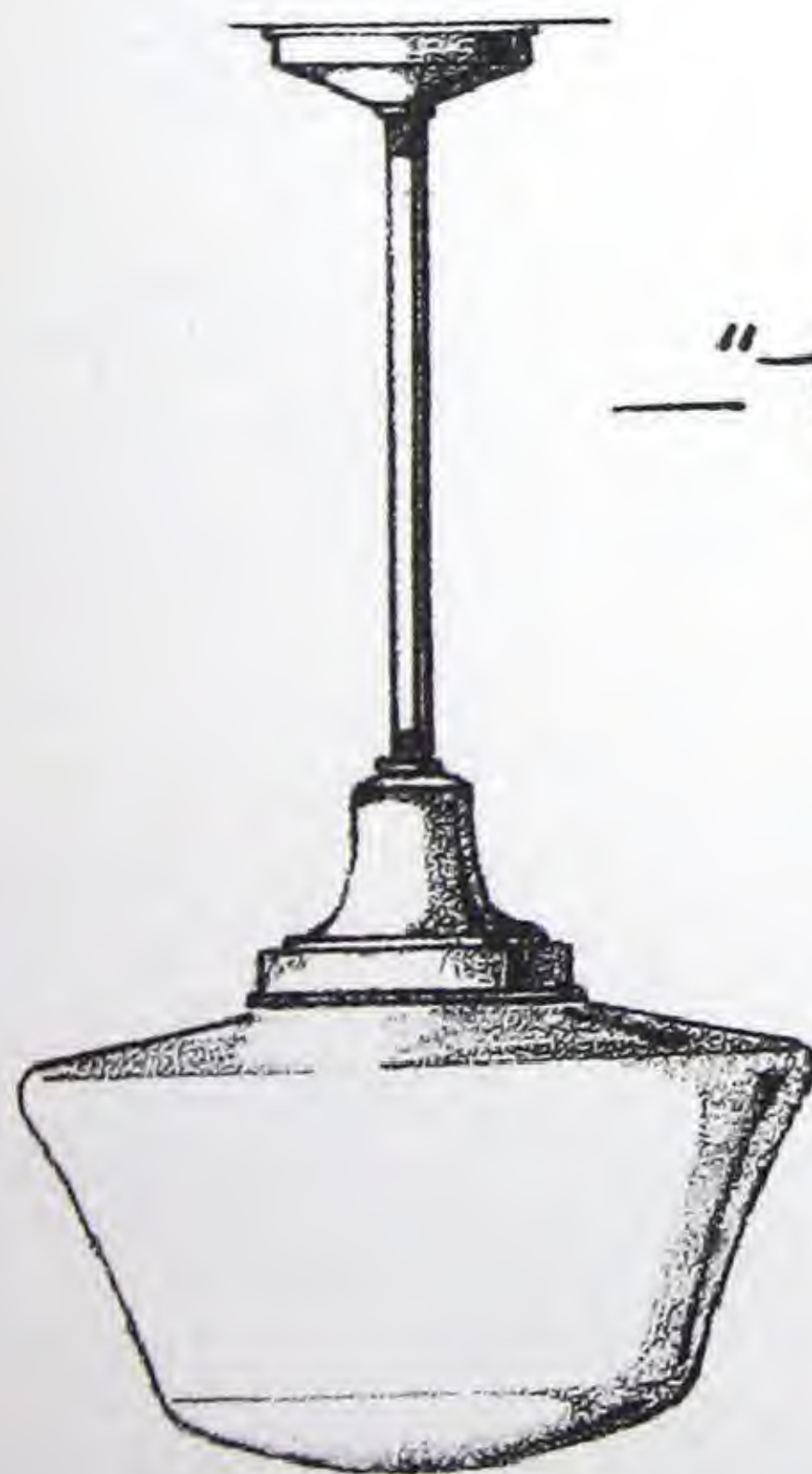
—THE—
—“HALLSTADT”—
—GALAX—



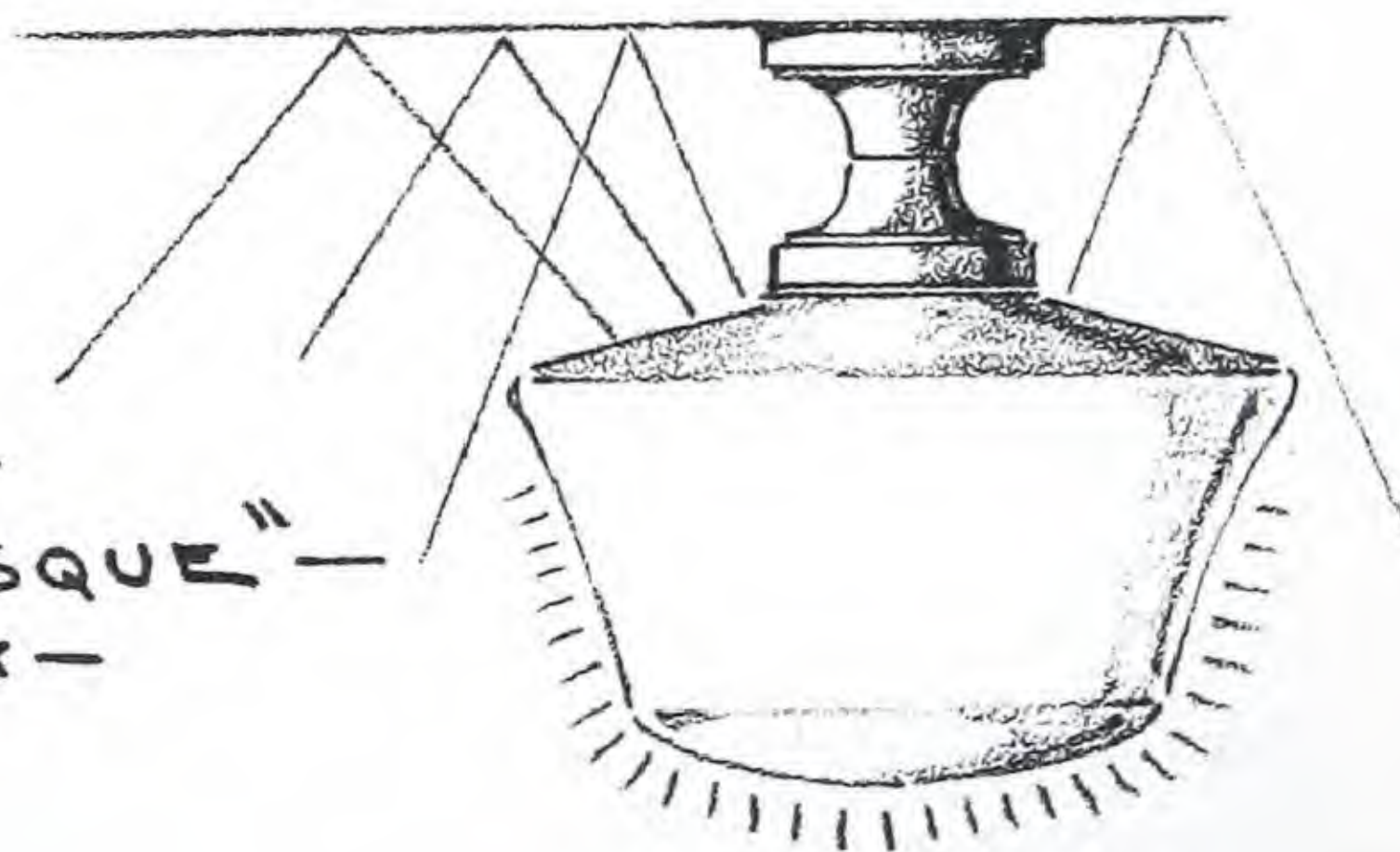
Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.	*Lamp Position, above, in.	Recommended wattage
4385	Galax	10	7 5/8	4	1/2	100
4309	Galax	12	9 1/2	6	1/4	150
4309A	Galax	12	9 1/2	4	1/4	150
3756	Galax	14	10	6	1	200
4386	Galax	16	12	6	1	300
5667	Galax	18	13 1/8	8	zero	500
12007	Galax	20	14 1/2	8	3	750

5667A GALAX 18 13 1/8 6 ZERO 500

*Lamp position—Represents the distance in inches of the lamp contact above the plane of the fitter screws in the fixture. Zero indicates the lamp contact is in the same plane as the fitter screws in the fixture.



—THE—
—“ROMANESQUE”—
—GALAX—



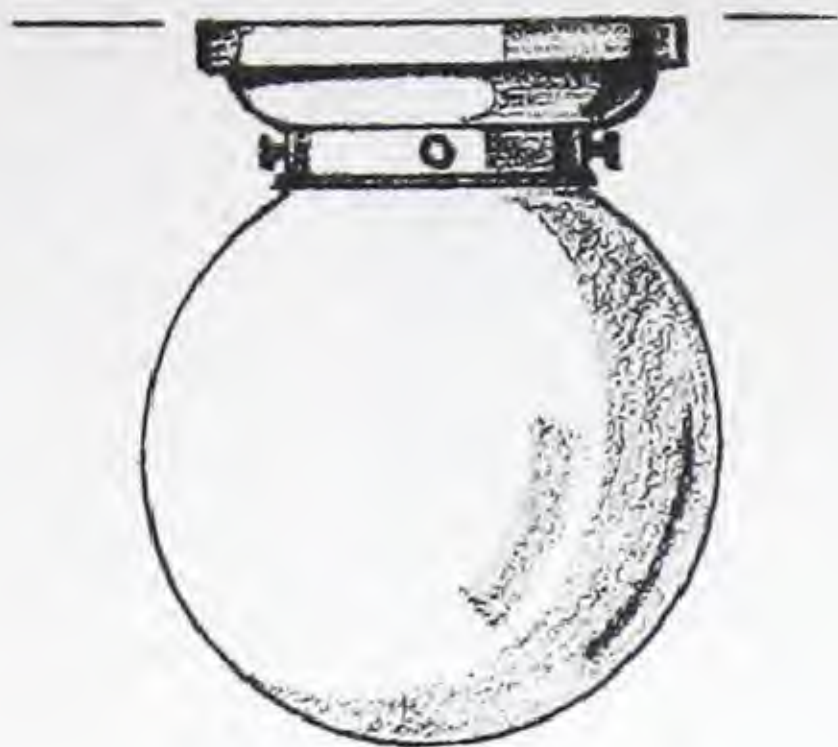
PLAIN GLOBES

Mould Number	Description	Diam. Inches	Depth Inches	Fitter Diam. Inches	*Lamp Position Inches	Recommended Wattage
12009	Galax	10	7 7/16	4	1 1/2	100
12010	Galax	12	8 3/4	6	1 1/2	150
12011	Galax	14	10	6	1 1/2	200
12012	Galax	16	11 3/8	6	2	300
12014	Galax	18	12 1/2	6	2	500

*Lamp position—Represents the distance in inches of the lamp contact above the plane of the fitter screws in the fixture.

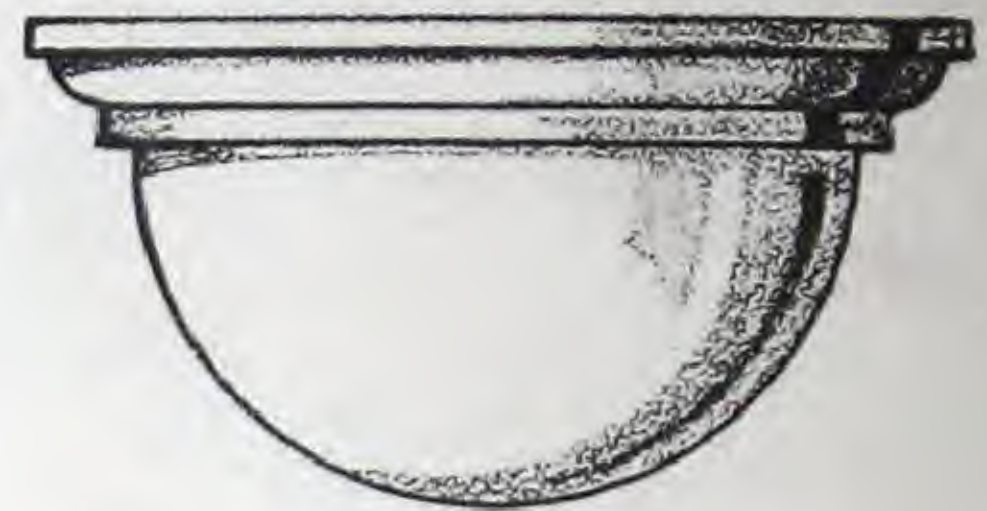
— OFFICE - LIGHTING —

— CORRIDORS, - WASHROOMS, - COAT ROOMS, - ETC. —



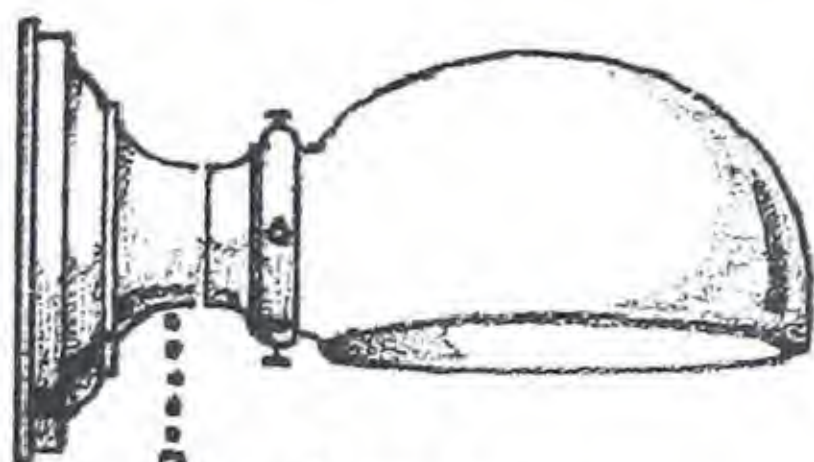
— MONAX —
ROUND BALL GLOBES

Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.
828	Monax or Red	6	6	3 1/4
830	Monax	7	7	3 1/4
832	Monax	8	8	4
850	Monax	10	10	4
848	Monax	10	10	5
849	Monax	10	10	6
838	Monax	12	12	6
1527	Monax	12	12	8
861	Monax	14	14	6
1004	Monax	14	14	7
1054	Monax	14	14	8



— MONAX —
Monax Hemispheres

Mould No.	Glass	Diam., in.	Depth, in.	Recommended wattage
175	Monax	8	4	60
165	Monax	10	5	100
160A	Monax	12	6	150
164	Monax	14	7	200
170	Monax	16	8	300



— MONAX —
HALF SHADE

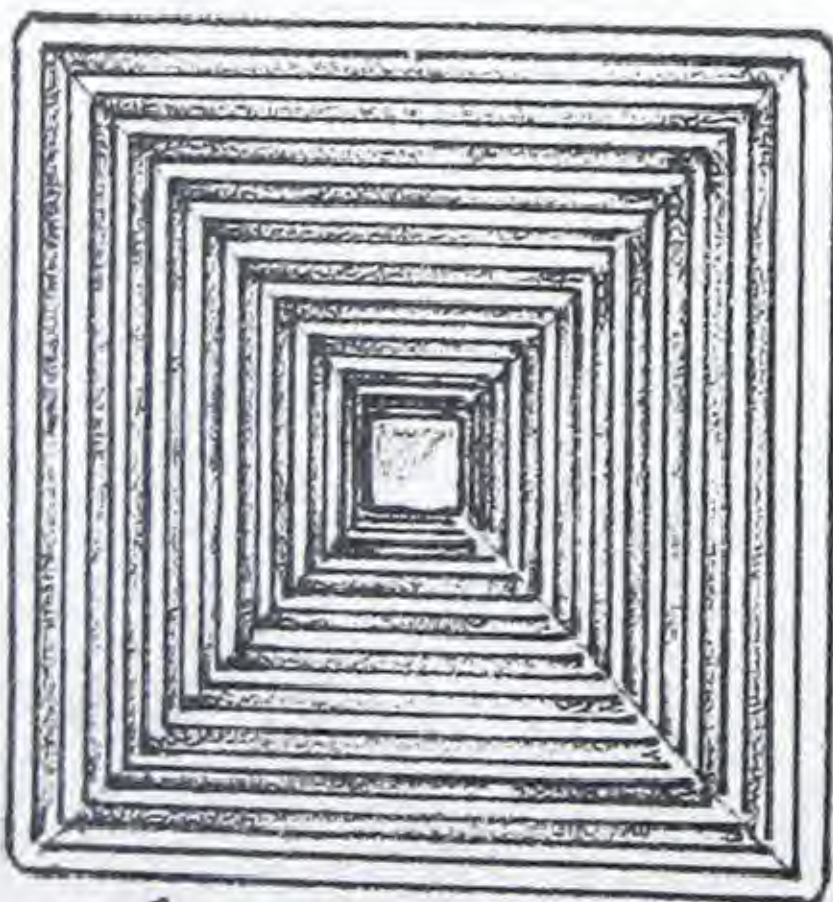
Mould No.	Description	Length in.	Height in.	Fitter diam., in.	Recommended wattage
4221	Monax	6	3 7/32	2 1/4	40



— MONAX —
BOWL TYPE SHADE

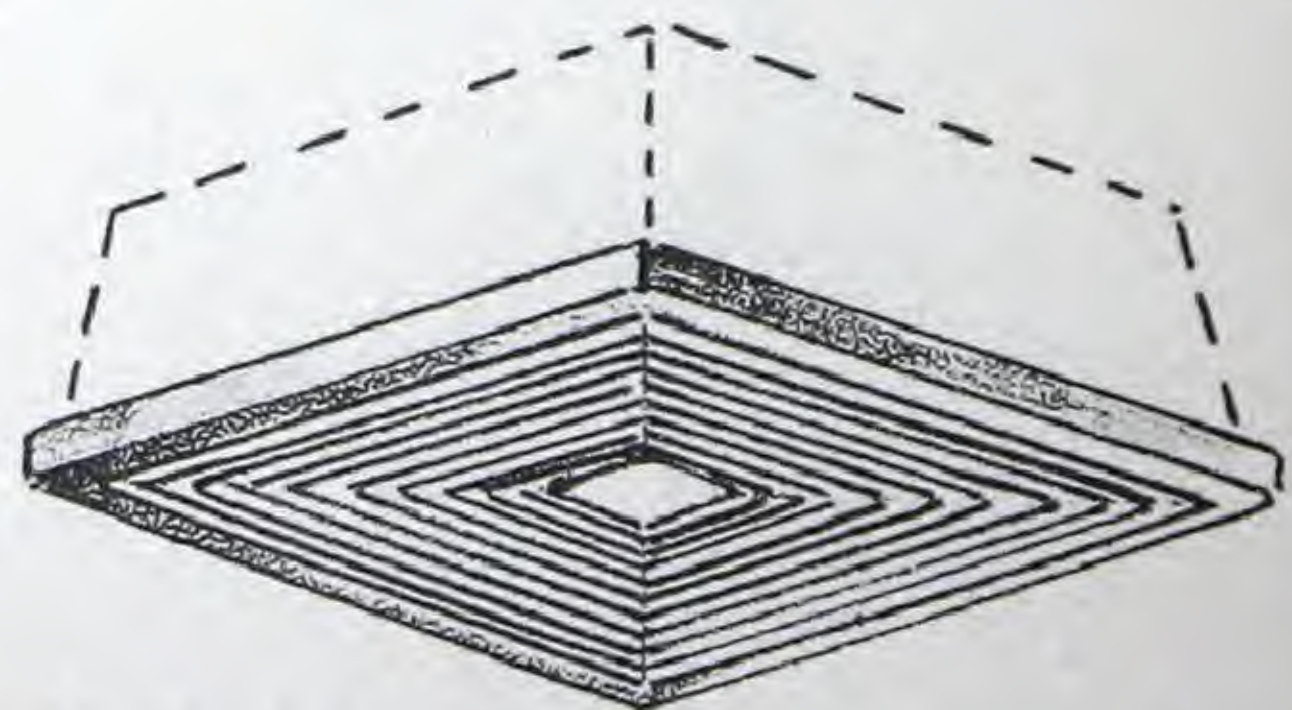
Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.	Recomd. wattage
5307	Monax	6 1/4	4 3/4	2 1/4	40
1623A	Monax	7	5	2 1/4	50
5308	Monax	8	5 11/16	2 1/4	60

— ILLUMINATING - PLATES —



— ALVAX - GLASS —

Mould Number	Side Dimension	Thickness
12109	6 1/2"	1/4"
12117	8"	1/4"
12120	12"	1/4"



— A - FLUSH - TYPE - CEILING - FIXTURE —
— FOR - LOW - CEILING, BENEATH - AND —
— OVER - BALCONIES, - EXCELLENT —
— ABOVE - FILE - CABINETS, —

School Lighting

Even though most school work is done during daylight hours there are inevitable cloudy days which necessitate supplementary lighting.

In a recent investigation of pupils retarded a year or more in their classes, 67% were found to have defective eyesight. Good lighting is insurance against eyestrain and its resulting nervous and physical fatigue.

The average cost for school operation in the United States is over \$80.00 per pupil per year. To adequately illuminate the average school room, the cost is less than \$80.00 per year. The cost of good lighting would be entirely absorbed by the effected saving if only a relatively small percentage of the six million pupils who have been retarded a year or more in school work, could be advanced with their regular classes.

Poor quality and inefficient luminaires can be quite expensive, despite their low initial cost. Inefficient luminaires either absorb an unwarranted quantity of light resulting in eyestrain and costly failures, or the inefficient luminaire requires an unwarranted amount of electrical energy to produce adequate illumination resulting in unnecessarily high current cost. Good quality, white diffusing glassware, either of the semi-direct or the semi-indirect enclosing globe type, (dependent upon the room and its use) has long been recognized as ideal for class room illumination. To differentiate between glass of quality and a cheap inefficient product, insist that each globe under consideration be tested under identical conditions. The Illuminating Engineering Society has set up a standard testing procedure for lighting glassware. This procedure is impartial and all glass submitted for a school lighting project should be considered only if accompanied by an analysis prepared under this Illuminating Engineering Society standard testing procedure. All standard Macbeth globes have been tested under these specifications and data are readily available.

The I E S Testing Specification does not set any standards for the quality of a lighting unit. It is only a uniform method of reporting the performance of any manufacturers' product. It provides an excellent basis for the school engineer or architect to determine a minimum acceptable standard specification which will insure quality lighting equipment in the school. Many such specifications are in use today all based on the I E S Testing Specification. MONAX and GALAX enclosing globes have found wide and satisfactory service in thousands of schools throughout the country.

Layout of Classroom Lighting

It is not within the scope of this recommendation to include either location of all classroom lighting units or the

wiring specifications for the building. Certain simple rules can be given which will act as a guide for a satisfactory schoolroom lighting system.

The spacing between outlets should not exceed 1-1/2 times the distance from the working plane to the lighting source. The spacing between the outlets and the wall should be approximately 1/2 the spacing between outlets. This spacing should be adhered to as closely as permitted by beams and other structural members.

More uniform illumination is obtained if semi-direct lighting enclosing globes are mounted as close to the ceiling as design permits. This high mounting also tends to remove the globes from the line of vision and hence improves seeing ability.

Semi-indirect lighting units should be suspended from the ceiling at a distance sufficient to illuminate the ceiling without causing spots of high brightness above the units. A suspension distance of 1/5 - 1/4 the ceiling height is usually satisfactory.

The wattage needed for each lighting unit is governed by the illumination desired in the classroom and by room conditions, such as the color of the ceiling and walls and the dimensions of the room. In any school room, the rows of seats farthest from the windows require more artificial illumination than those nearby. In the fixtures used to illuminate such seats, it is good practice to install lamps of the next higher wattage than those used in fixtures nearer the windows. Since most classrooms have light walls and ceilings and are not too different in general room proportions the rough rule that, 1 watt per square foot will produce about 5 foot candles under favorable conditions with quality equipment, can be applied to classroom lighting, if used cautiously.

Suggested Specification for Semi-Indirect Enclosing Globes

For use in all classrooms where the seeing task is severe and where a good highly reflecting ceiling permits their use.

Material

The glass shall be of the best quality, uni-layer homogeneous character, free from streaks, cords and blisters which would detract from the appearance of the unit, shall be mechanically strong and well annealed. The globe shall be totally enclosing except for the fitter opening and constructed in such a manner that the bottom of the globe is of a dense white highly reflecting character causing a major portion of the light emitted by the lamp to be reflected upward according to the semi-indirect lighting principle, while the upper portion of the globe is of a slightly diffusing character permitting a large percentage of the light to be transmitted up-

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MONA
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Lamp
100 w
150 w
200 w

ward. The fitter edge of the globe shall have a fire polished finish. Each globe shall be stamped with the name of the manufacturer.

Size and Shape

The shape shall conform to that shown on the accompanying illustration. The globes shall conform to the following schedule of sizes for respective wattages.

<u>Lamp Size</u>	<u>Globe Diameter</u>
100 W	10"
150 W	12"
200 W	14"
300 W	16"
500 W	18"
750 W	20"

Photometric Characteristics

The bidder shall submit data showing results of photometric tests on the glass globes which he proposes to supply. The photometric analysis shall be made by a competent testing laboratory according to the provisions of the "I E S Specifications for Testing Diffusing Type Enclosing Glassware".

To be acceptable the product must show an overall efficiency of not less than 72% with not more than 25% of the light output of the bare lamp in the 0-90° zone. The maximum surface brightness at any point in the line of vision shall not exceed 3 candles per square inch.

Inspection and Approval

The successful bidder shall submit a sample, or samples of the luminaire to the engineers (or architects) office together with the photometric data, for approval before executing the order. All globes and fixtures delivered for this installation will be subject to inspection by a representative of the engineer's (or architect's) office. Failure to conform with the above specification in any way shall be sufficient reason for rejection.

Suggested Specification for Semi-Direct Enclosing Globes

(White Diffusing Glassware)

Glassware to be furnished on this installation shall be MONAX (name of globe) globe or equal to be approved by the architect. Enclosing globes shall be in accordance with the schedule of sizes.

<u>Lamp</u>	<u>Minimum Diameter of Globe</u>	<u>Fitter</u>	<u>Lamp</u>	<u>Minimum Diameter of Globe</u>	<u>Fitter</u>
100 watt	12"	4"	300 watt	18"	6"
150 watt	14"	6"	500 watt	20"	8"
200 watt	16"	6"	750 watt	20"	8"

All glassware shall be homogeneous in texture, shall be uniform in quality, shall be free from objectionable imperfections such as streaks, cords, stones, blisters, etc.; shall be of sufficient weight and uniform thickness so as to have mechanical strength and shall be properly annealed. The light output of the globe shall not be less than 82% and the maximum surface brightness of the globe shall not exceed 3 candles per square inch when tested in accordance with the above schedule of lamp with globe sizes. The fitter edge of the globe shall have a fire polished finish. Each globe shall be stamped with the name of the manufacturer.

Before executing the order the successful bidder shall submit a sample or samples of the luminaire to the engineers (or architects) office together with photometric data showing results of tests on the glass globes which he proposes to supply. These photometric analyses shall be made by a competent testing laboratory according to the provision of the "I.E.S. Specifications for Testing Diffusing Type Enclosing Glassware". All globes and fixtures delivered for this installation will be subject to inspection by a representative of the engineer's (or architect's) office. Failure to conform with the above specifications in any way shall be sufficient reason for rejection.

Simplified Illumination Calculation Procedure

First - Determine foot-candles required from Table 1.

Second - Determine "Condition Factor" for the interior whether "Favorable", "Average" or "Unfavorable". The "Conditions Factor" will depend upon the room proportions, color of ceiling and upper walls, and the maintenance of equipment. Typical "Average Conditions Factor" consists of -

Room proportions

Width approximately twice ceiling height

Color of ceiling and walls

Maintenance of equipment

- Medium

- Fair

The "Condition Factor" becomes more "Favorable" as the width of the interior increases in proportion to its height; as the color of ceiling and upper walls become lighter; and as the maintenance of equipment improves.

Third - Decide which type of illuminating glassware (Monax or Galax or Denax) is desired.

Fourth - Decide mounting height. Ordinarily, an overall fixture length (ceiling to underside of enclosing globe) of one-fourth ceiling height may be used. Ceiling type fitters should be used on low ceilings.

Fifth - Locate in first column, Table 2, the contemplated "Area per Outlet" or Approximate Spacing and further narrow this down to the "Conditions Factor" determined in second step. Then traverse Table 2 horizontally to the right until the de-

sired foot-candle intensity (as determined in first step) is located in the correct glassware section. If not so found, then go to a closer spacing until desired foot-candle intensity is located. Directly above in the column heading is the required lamp size.

Table #1

Recommended Standards for Good Illumination For Schools

*Range		*Range		*Range	
Classrooms		Drafting Rooms	30-15	Cafeterias	8-4
(On Desks and		Art Rooms	30-15	Locker Rooms	4-2
Blackboards)	20-10	Shops	20-10	Corridors, etc.	4-2
Study Halls	20-10	Laboratories	20-10	Sight Saving	
Libraries	20-10	Auditoriums	8-4	Classrooms	40-25
Sewing Rooms	30-15	Assembly Rooms	8-4	Gymnasiums	20-10

* Range is given in order to take into account differences in school systems regarding the severity of visual tasks.

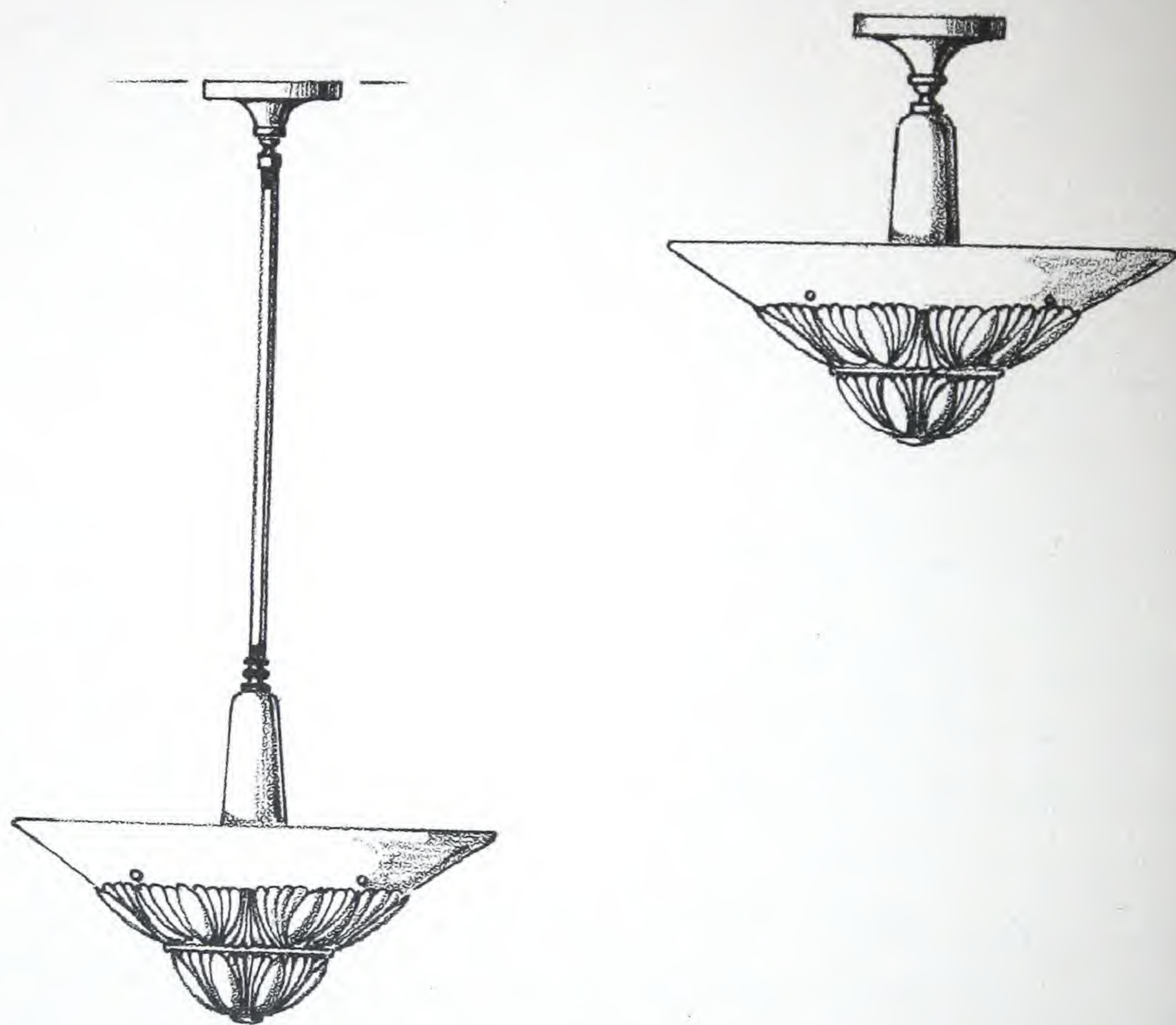
TABLE 2
AVERAGE FOOT CANDLES

Area Per Outlet or Approximate Spacing	Condition of Room for Good Lighting	MONAX				GALAX				DENAX				
		Semi-Direct Lighting				Semi-Indirect Lighting				Luminous		Indirect Lighting		
		150	200	300	500	150	200	300	500	16" Bowl	18" Bowl	22"		
		Lamp 14"	Lamp 16"	Lamp 18"	Lamp 20"	Lamp 12"	Lamp 14"	Lamp 16"	Lamp 18"	150 Watt Lamp	200 Watt Lamp	300 Watt Lamp	500 Watt Lamp	750 Watt Lamp
85-95 Sq Ft or 9-1/2' x 9-1/2' Spacing	Favorable	9-12	12-16	19-27	31-43	7-10	10-14	16-22	25-36	7-10	10-14	16-22	25-36	37-50
	Average	6-8	8-11	13-18	20-31	5-7	6-9	11-16	16-24	5-7	6-9	11-16	16-24	24-37
	Unfavorable	4-6	5-7	8-12	13-20	3-4	4-5	7-11	10-15	3-4	4-5	7-11	10-15	16-24
95-110 Sq Ft or 10' x 10' Spacing	Favorable	8-10	10-14	17-23	29-37	6-9	9-12	15-20	23-33	6-9	9-12	15-20	23-33	34-46
	Average	6-8	7-9	11-16	20-28	4-6	6-8	9-14	15-23	4-6	6-8	9-14	15-23	22-34
	Unfavorable	3-5	4-6	7-10	13-20	2-4	3-5	6-9	9-14	2-4	3-5	6-9	9-14	15-22
110-125 Sq Ft or 11' x 11' Spacing	Favorable	7-9	9-12	15-20	25-34	5-7	8-11	13-18	20-30	5-7	8-11	13-18	20-30	30-40
	Average	4.5-6	6-8	9-14	18-24	4-5	5-7	9-12	13-20	4-5	5-7	9-12	13-20	19-30
	Unfavorable	3-4	4-6	6-9	11-17		2-4	6-9	9-12		2-4	6-9	9-12	13-19
125-145 Sq Ft or 11-1/2' x 11-1/2' Spacing	Favorable	5.5-8	8-11	13-17	22-30	5-6	7-9	11-16	18-26	5-6	7-9	11-16	18-26	25-34
	Average	4-5	5.5-7	8-12	14-21	3-5	4-6	7-10	12-18	3-5	4-6	7-10	12-18	16-25
	Unfavorable		4-5	5-8	9-14		2.0-3	5-7	8-11		2-3	5-7	8-11	12-16
145-170 Sq Ft or 12-1/2' x 12-1/2' Spacing	Favorable	5-6	7-10	10-15	19-25	3.5-5	6-8	9-13	17-24	3.5-5	6-7	9-13	17-24	22-30
	Average	3-4	5-7	7-10	13-18	2-3	3-5	6-9	11-17	2-3	3-5	6-9	11-17	13-22
	Unfavorable		3.5-5	5-7	8-12		2-3	4-6	7-11		2-3	4-6	7-11	9-13
170-200 Sq Ft or 13-1/2' x 13-1/2' Spacing	Favorable		6-8	9-12	17-22	750 W Lamp 20" Globe	5-6	8-11	14-19		5-6	8-11	14-19	18-25
	Average		4-6	6-9	11-16		3-4	5-8	9-14		3-4	5-8	9-14	12-18
	Unfavorable		3-4	4-6	7-10		2-3	3-5	6-9		2-3	3-5	6-9	8-12
200-230 Sq Ft or 14-3/4' x 14-3/4' Spacing	Favorable		5-6	8-11	14-20	18-23	4-5	7-10	12-16		4-5	7-10	12-16	15-23
	Average		3-5	5-8	9-13	11-16	3-4	4-7	8-12		3-4	4-7	8-12	10-15
	Unfavorable		2.5-3	3.5-5	6-9	7-10	2.0-3	3-4	5-8		2-3	3-4	5-8	7-10
230-260 Sq Ft or 15-1/2' x 15-1/2' Spacing	Favorable		4-5.5	7-10	12-17	15-21	3.5-4	6-8	10-14		3-4	6-8	10-14	15-21
	Average		3-4	5-7	9-11	10-15	3.0-3.5	4-6	7-10		2-3	4-6	7-10	9-14
	Unfavorable		2-3	3-5	6-8	7-10		2-4	4-7			2-4	4-7	6-9
260-300 Sq Ft or 16-3/4' x 16-3/4' Spacing	Favorable		3.5-5	6-8	11-15	13-18	3-4	5-7	9-12		2-4	5-7	9-12	12-18
	Average		3.0-3.5	4-5	7-10	8-13		3-5	5-8			3-5	5-8	9-12
	Unfavorable			3-4	5-7	5-8		2-3	3-5			2-3	3-5	5-8
300-340 Sq Ft or 18' x 18' Spacing	Favorable			5-7	10-13	12-14		4-6	8-11			4-6	8-11	10-14
	Average			3.5-4	6.5-9.5	7-11		3-4	5-8			3-4	5-8	7-10
	Unfavorable			2.5-3	4-6.5	4-7			3-5				3-5	4-7

*Figures given are for MONAX Semi-Direct Lighting Decrease by 5% for GALAX Semi-Indirect Lighting

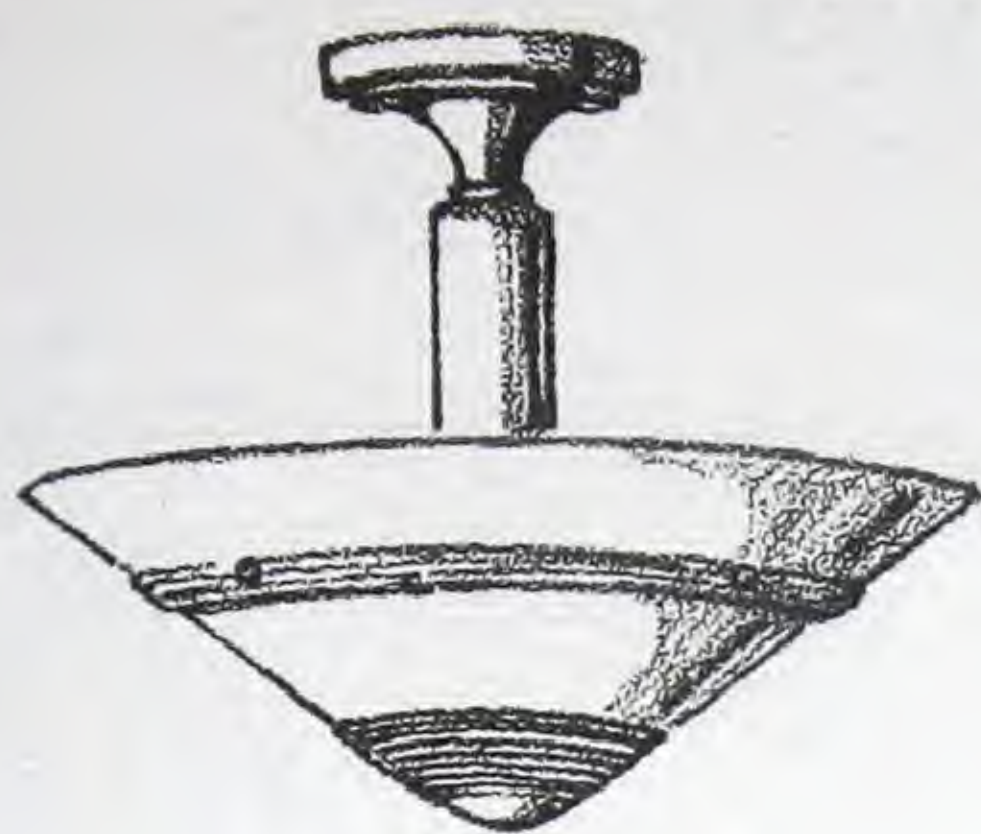
MONAX and GALAX enclosing globes have given good illumination and satisfactory service in thousands of schools throughout the country. The following pages illustrate glass for school lighting.

— SCHOOL-LIGHTING —
 — LUMINOUS-INDIRECT —
 — THE-CAPITOL —
 — DENAX-GLASS —

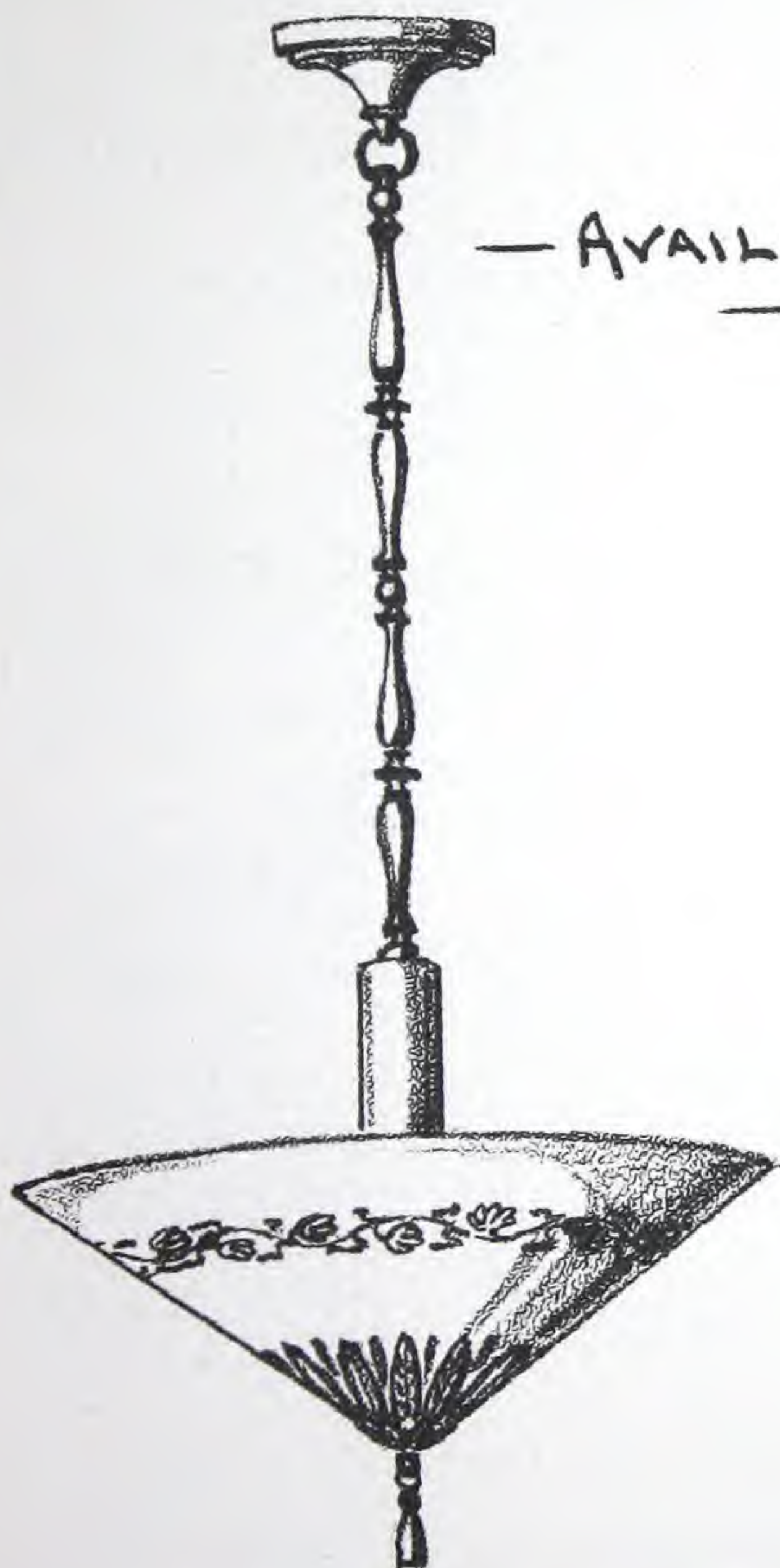
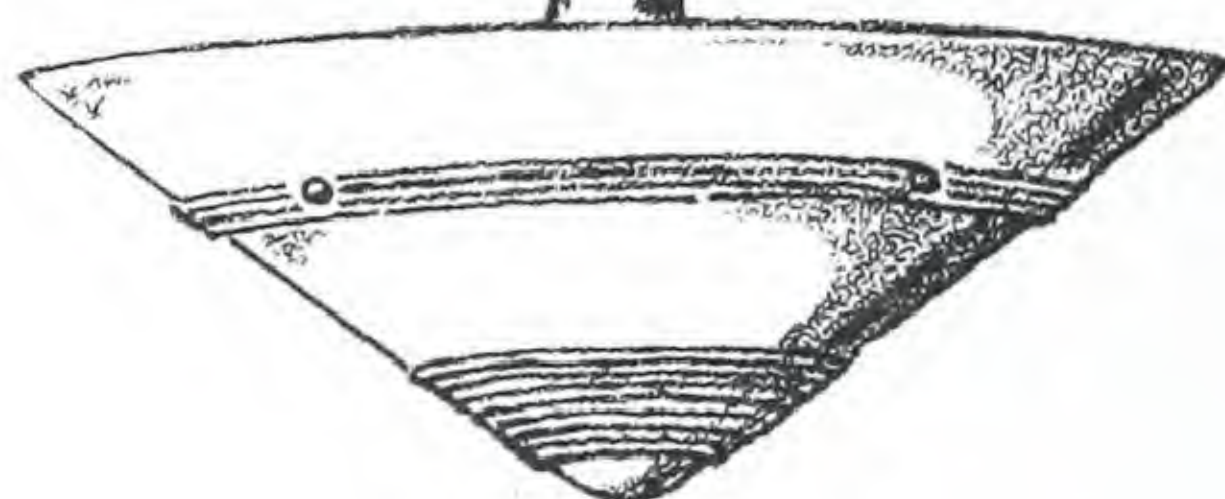


— PROPRIETARY-MOLD-AVAILABLE-THROUGH-THE —
 — ART-METAL-COMPANY-AND-THEIR-DISTRIBUTORS —

— SCHOOL-LIGHTING —
 — LUMINOUS-INDIRECT —
 — DENAX-GLASS —



— AVAILABLE - IN - ALL —
 — SIZES —



— PROPRIETARY MOLD — AVAILABLE THROUGH WESTINGHOUSE —
 — ELECTRIC & MANUFACTURING COMPANY AND THEIR —
 — DISTRIBUTORS —

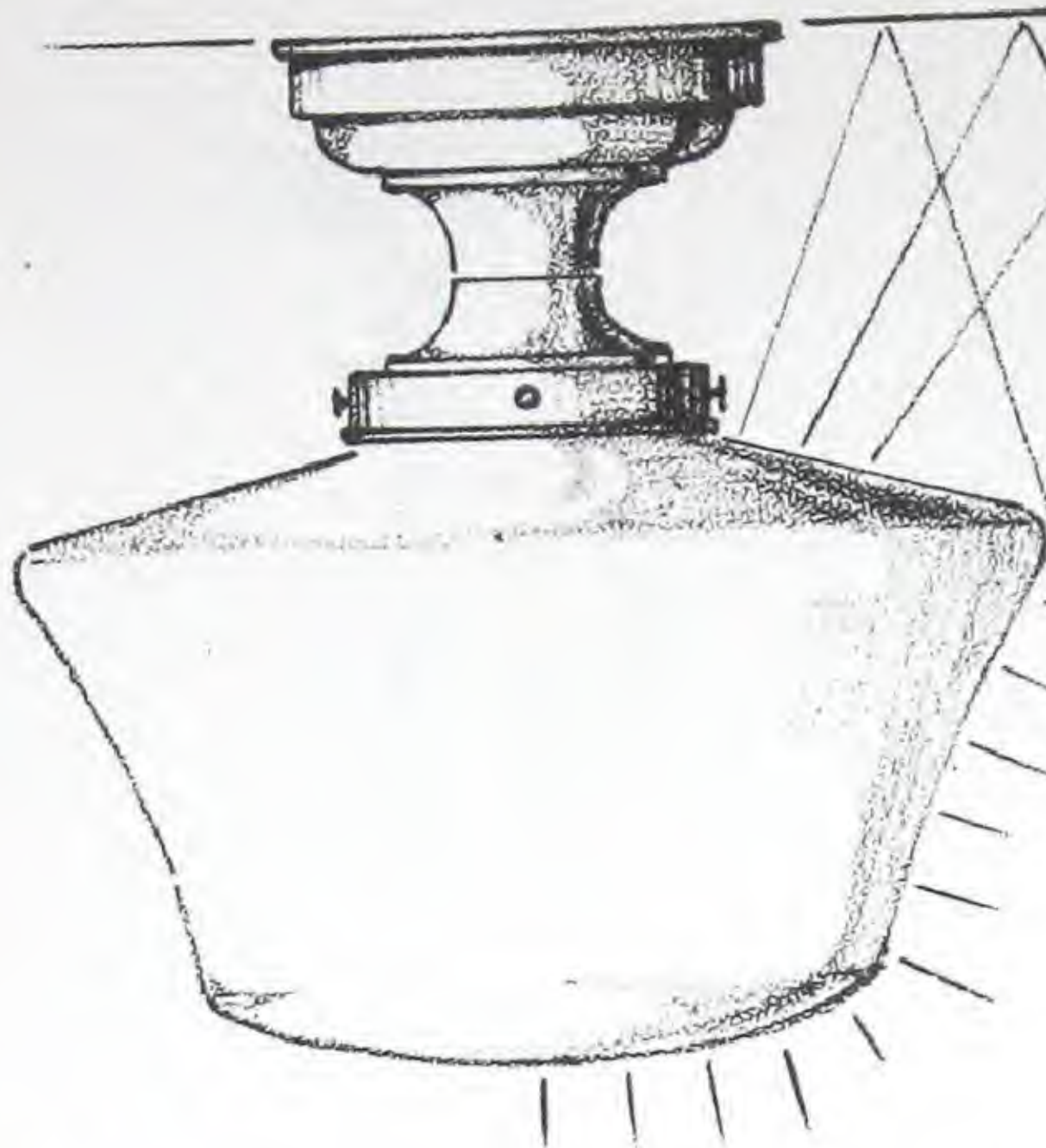
— CORNING - GLASS - WORKS —

SCH 7

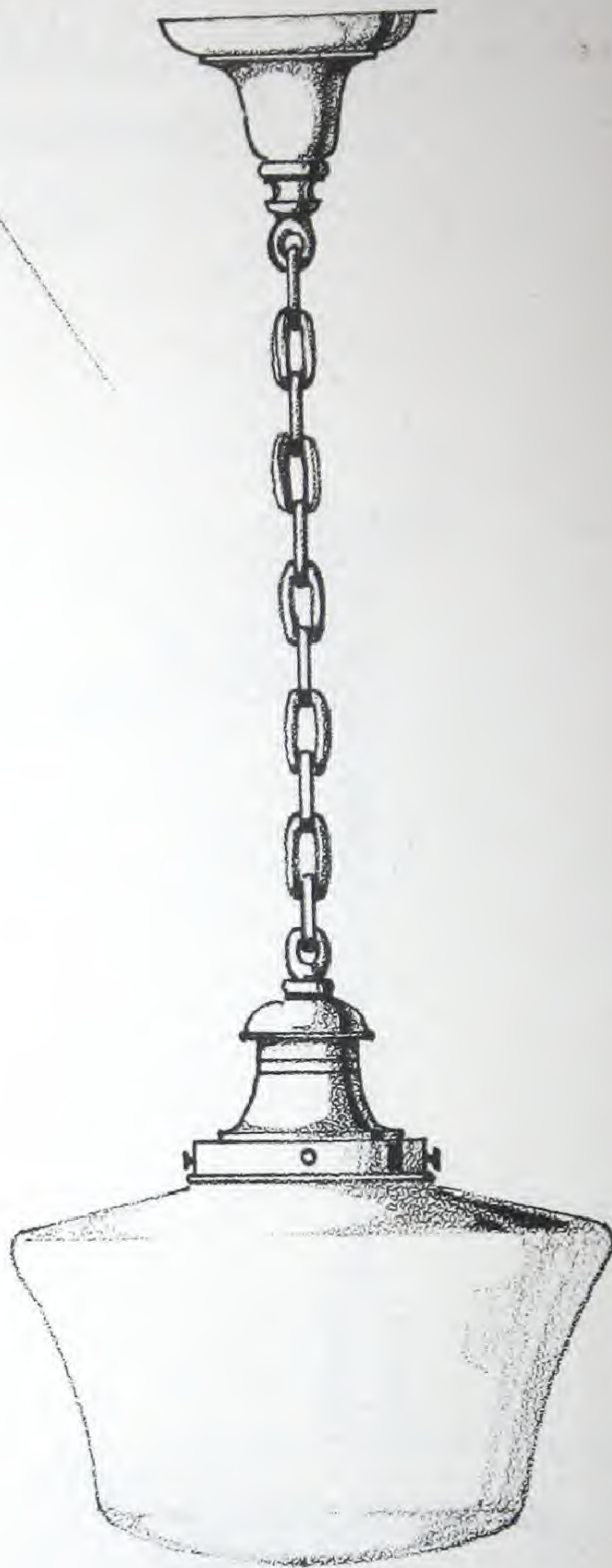
SCHOOL-LIGHTING—

"ROMANESQUE" (SEMI-INDIRECT)

— GALAX - GLASS —



CLOSE UP FOR LOW CEILINGS



ELECTRICAL TESTING LABORATORIES
NEW YORK, N. Y.

REPORT NO. 134591

ORDER NO. 57611-S

PLATE NO. 27857

CANDLEPOWER DISTRIBUTION

NO. 12011 GALAX GLOBE

Tested in Compliance with Illuminating Engineering Society
Standard Testing Specifications
Rendered to Macbeth-Evans Glass Company.

Globes - 40 Submitted; 25 Inspected and
Weighed; 6 Tested.
Light output range 68 to 75.5%. Average 73%.
Lamp - 200 Watts; 115 Volts;
3400 Lumens; PS30
Inside Frosted Gas-
Filled Bulb; C-9
Filament; Medium
Base; General
Service.
Surface covering
globe opening,
reflection factor
0.40.

White Diffusing Glass
Weight of test sample - 80 oz.

LUMINAIRE DISTRIBUTION DATA					
MEAN VERTICAL					
ANGLE	CANDLES	CD/DEGREE	ANGLE	CANDLES	CD/DEGREE
180°	396	396	90°	112	112
175°	390	37	85°	108	116
165°	386	109	75°	112	119
155°	391	180	65°	122	121
145°	372	235	55°	133	119
135°	364	280	45°	142	110
125°	329	292	35°	146	92
115°	246	244	25°	148	69
105°	163	173	15°	148	42
95°	122	133	5°	148	14
0°			0°	148	

LIGHT FLUX VALUES

ZONE	LEFT	RIGHT	PERCENT TOTAL LUMENS BASE LINE	PERCENT LIGHT OUTPUT
0°-90°	934	446	13	
0°-90°	1742	804	23.5	
90°-180°	1656	1683	49.5	
0°-180°	3398	2487	73	

LUMINAIRE BRIGHTNESS

CANDLEPOWER PER SQUARE INCH
THE FIGURES INDICATE THE LOCATION AND ANGLE OF VIEW

LOCATIONS	A	B	C	D	E	F	G	H	I	J	K	L	M
CP. PER SQ. IN.	1.0	1.0	1.1	3.5	1.3	0.7	1.1	1.2	1.2	1.1	1.2	1.7	

TESTED BY *W. F. H.* PLOTTED BY *W. F. H.* COMPUTED BY *W. F. H.* CHECKED BY *W. F. H.* ISSUED February 28th, 1935.

APPROVED BY *William F. H.*
ENGINEER IN CHARGE OF PHOTOMETRY

C. F. H.
IN CHARGE OF TEST

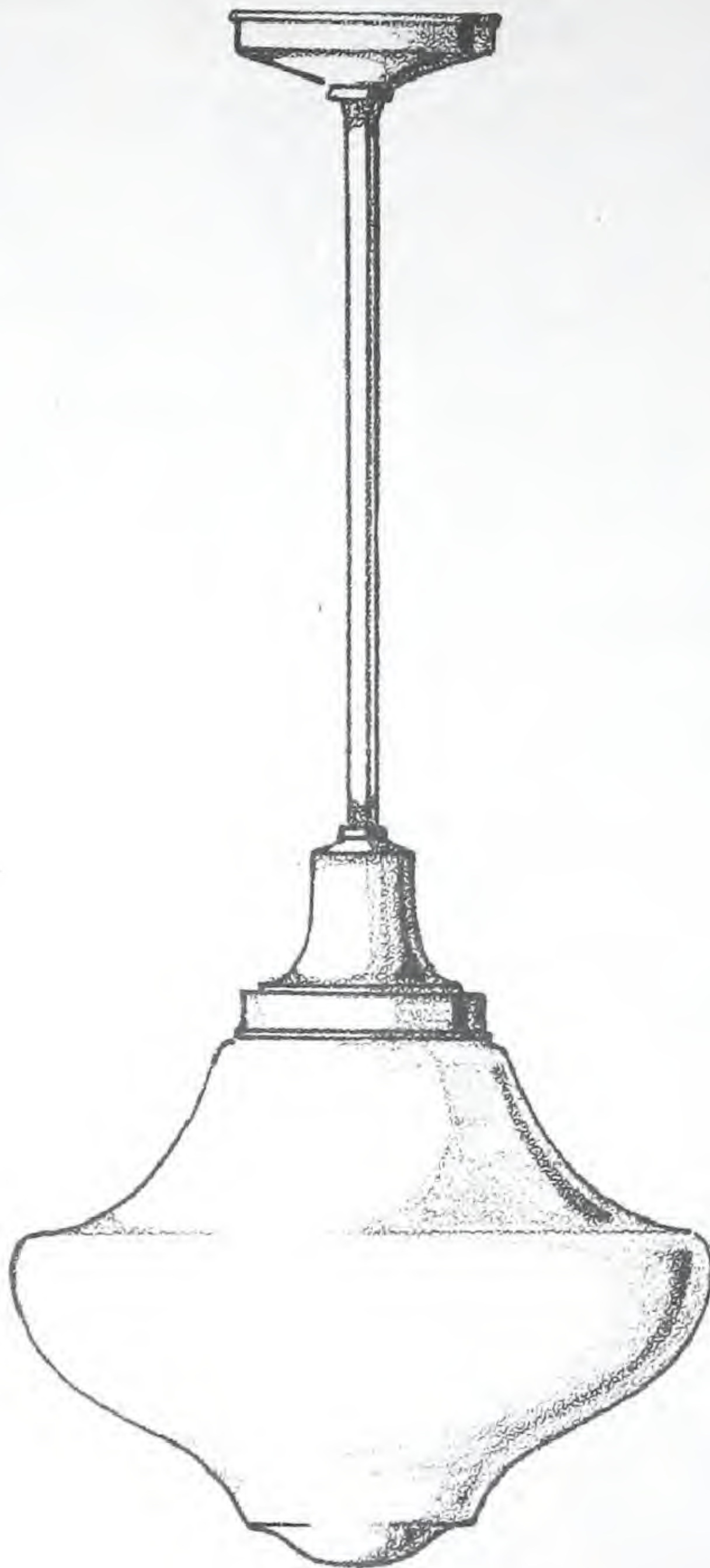
Mould Number	Description	Diam. Inches	Depth Inches	Fitter Diam. Inches
12009	Galax	10	7 7/16	4
12010	Galax	12	8 3/4	6
12011	Galax	14	10	6
12012	Galax	16	11 3/8	6
12014	Galax	18	12 1/2	6

SCHOOL-LIGHTING

"THE-HALLSTADT"

SEMI-INDIRECT

GALAX-GLASS



ELECTRICAL TESTING LABORATORIES
NEW YORK, N. Y.

REPORT NO. 134590

ORDER NO. 57611-S

PLATE NO. 27856

CANDLEPOWER DISTRIBUTION
NO. 3756 GALAX GLOBE

Tested in Compliance with Illuminating Engineering Society
Standard Testing Specifications

Rendered to Macbeth-Evans Glass Company

Globes - 80 Submitted; 25 Inspected and
Weighed; 6 Tested.
Light output range 76 to 78%. Average 77.5%.
Lamp - 200 Watts; 115 Volts; 3400 Lumens;
PS30 Inside Frosted
Gas-Filled Bulb; C-9
Filament; Medium
Base; General
Service.
Surface covering
globe opening,
reflection factor
0.40.

White Diffusing
Glass
Weight of test sample - 83 Gms.

LUMINAIRE DISTRIBUTION DATA				
MEAN VERTICAL				
ANGLE	CD	FOOT	ANGLE	CD
180°	327	30"	0°	156
175°	322	31	5°	144
170°	320	32	10°	133
165°	323	150	15°	118
160°	325	210	20°	106
155°	346	268	25°	98
150°	332	297	30°	87
145°	295	293	35°	70
140°	248	262	40°	45
135°	182	202	45°	15
130°			50°	162

LUMINAIRE BRIGHTNESS

CANDLEPOWER PER SQUARE INCH

THE FIGURES INDICATE THE LOCATION AND ANGLE OF VIEW

LOCATIONS

CD PER SQ. IN.

TESTED BY

PLOTTED BY

COMPUTED BY

CHECKED BY

ISSUED

FEBRUARY 28th, 1935.

APPROVED BY

ENGINEER IN CHARGE OF PHOTOMETRY

C. E. Horn

IN CHARGE OF TEST

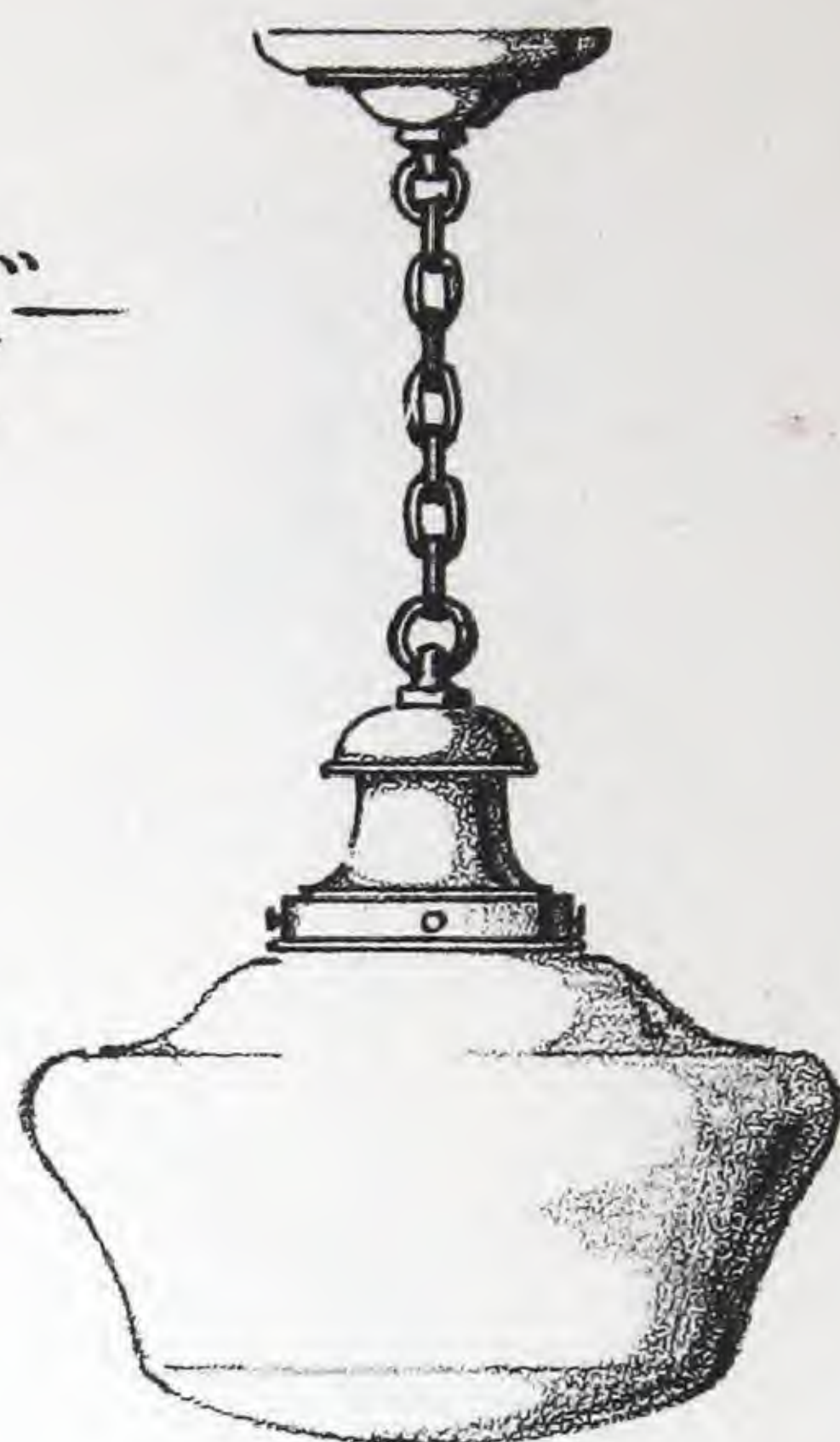
Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.
4385	Galax	10	7 5/8	4
4309	Galax	12	9 1/2	6
4309A	Galax	12	9 1/2	4
3756	Galax	14	10	6
4386	Galax	16	12	6
5667	Galax	18	13 1/8	8
12007	Galax	20	14 1/2	8

5667A GALAX 18 13 1/8 6

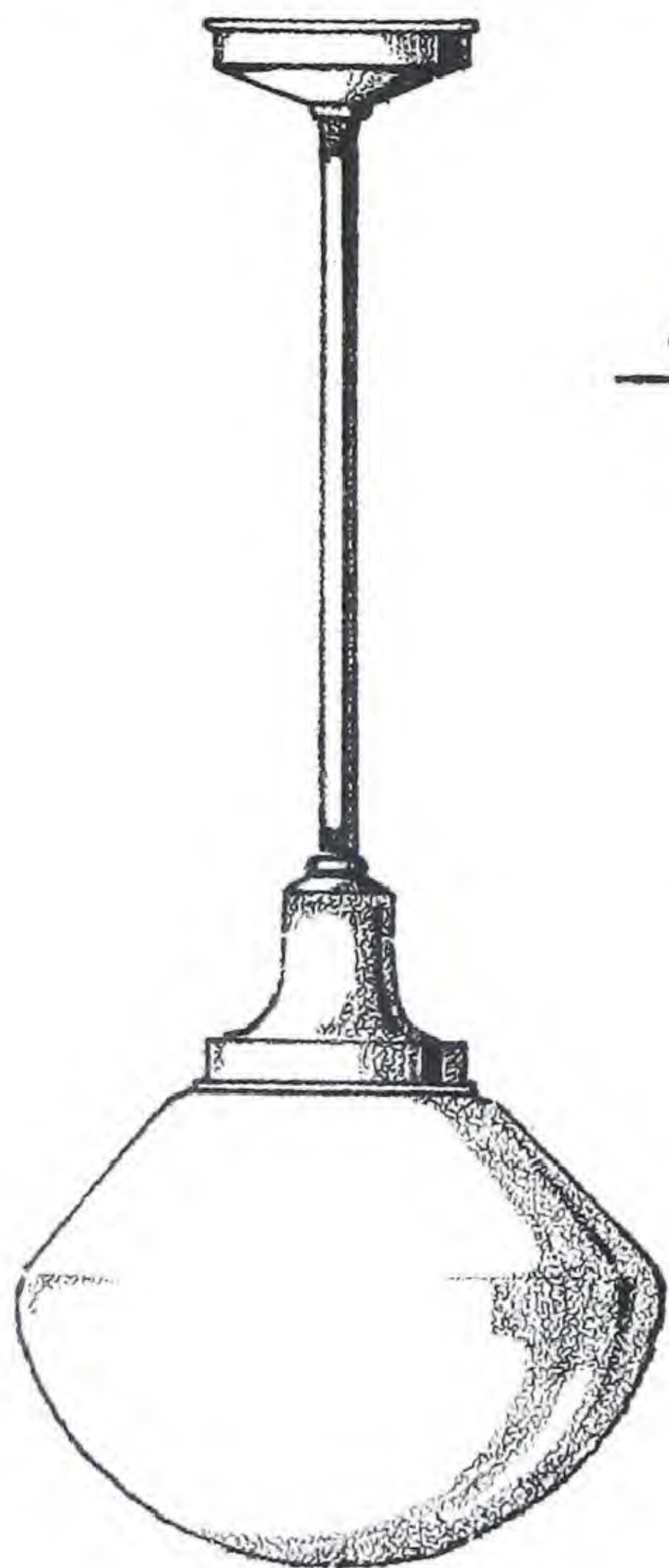
— SCHOOL - LIGHTING —
— SEMI - DIRECT —



— "THE SEVILLE" —
— MONAX - GLASS —



Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
5294-A	Monax	8 1/2	5 9/16	4
5340	Monax	9	6 1/2	4
5295	Monax	10	6 1/2	4
5296	Monax	12	7 3/4	6
5296-A	Monax	12	7 3/4	4
5297	Monax	14	9	6
5298	Monax	16	10 1/4	6
5645-A	Monax	18	11 3/8	6
5666	Monax	20	12 3/4	8



— "THE PILGRIM" —
— MONAX - GLASS —



Mould Number	Description	Diameter Inches	Depth Inches	Fitter Diameter Inches
12300	Monax	8 7/16	7	4
12301	Monax	9 7/16	7 1/2	4
12302	Monax	10 7/16	8 5/16	4
12304	Monax	12	9 3/16	6
12305	Monax	14	10 1/2	6
12306	Monax	16	11 3/4	6
12307	Monax	18	13 3/16	6
12304A Monax		12	9 7/16	4

SCHOOL LIGHTING

CORRIDORS. WASHROOMS. CLOAK ROOMS



ROUND BALL GLOBES

Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.
828	Monax	6	6	3 1/4
830	Monax	7	7	3 1/4
832	Monax	8	8	4
850	Monax	10	10	4
848	Monax	10	10	5
849	Monax	10	10	6
838	Monax	12	12	6
1527	Monax	12	12	8



Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.
5294A	MONAX	8 1/2	5 9/16	4



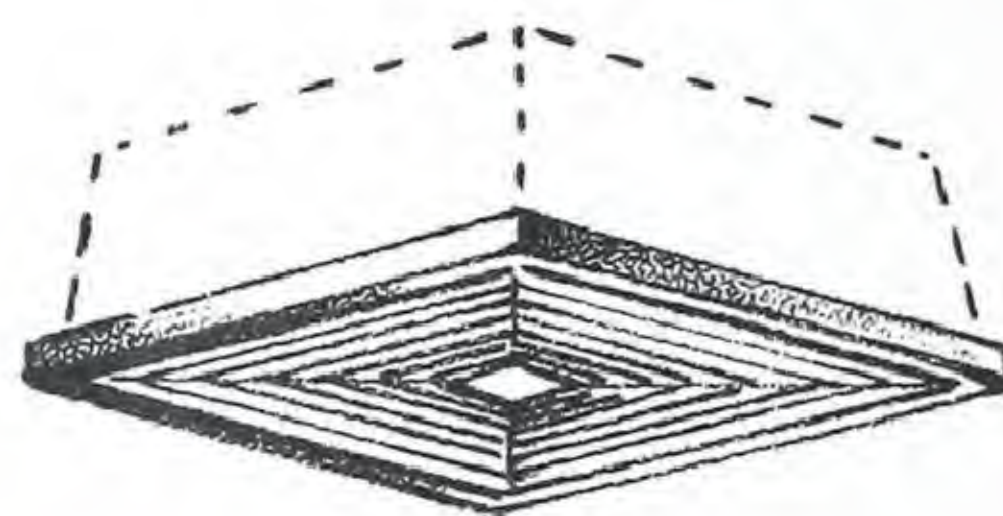
BOWL TYPE SHADE

Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.	Recomd. wattage
12336	Monax	6 1/4	4 3/4	2 1/4	40
1623A	Monax	7	5	2 1/4	50
12314	Monax	8	5 11/16	2 1/4	60



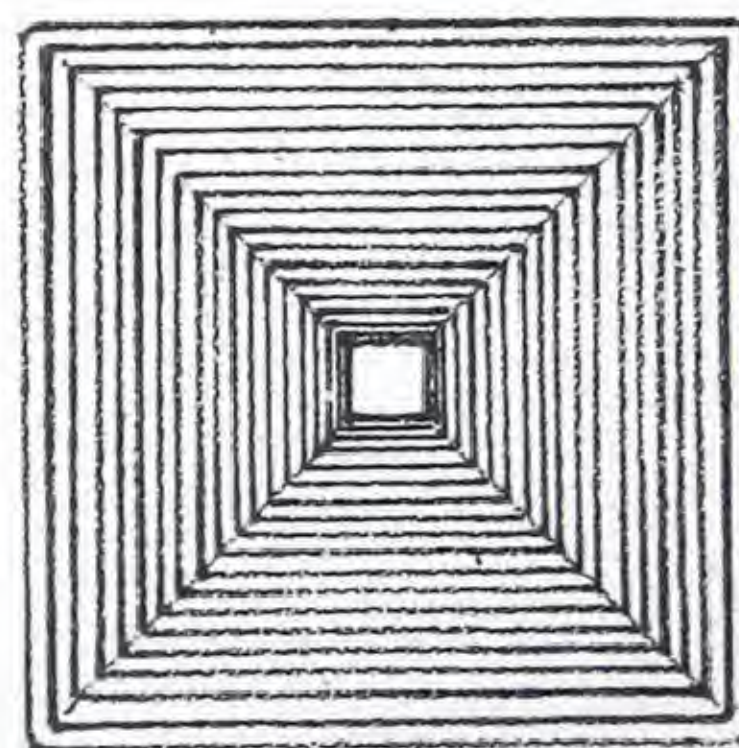
HALF SHADE

Mould No.	Description	Length in.	Height in.	Fitter diam., in.	Recommended wattage
4221	Monax	6	3 7/32	2 1/4	40



Plain Monax Bowls

Mould No.	Glass	Diameter, Inches	Depth, Inches
12192	Monax	8	3 1/2
12146	Monax	10	4
12147	Monax	12	4



Mould Number	Side Dimension	Thickness
12109	6 1/2"	1/4"
12117	8"	1/4"
12120	12"	1/4"

— SCHOOL - LIGHTING —

— VESTIBULES, - LOBBIES, ETC. —



MONAX EXIT CUBE

Number 17 Des. 44 Monax Dimensions 6" Cube 3 1/4" Fitter
 The lettering appears upon three sides of the cube.
 The bottom is white diffusing glass permitting light to be directed on the floor of the exit.
 Can be furnished upright with lettering reversed if desired.



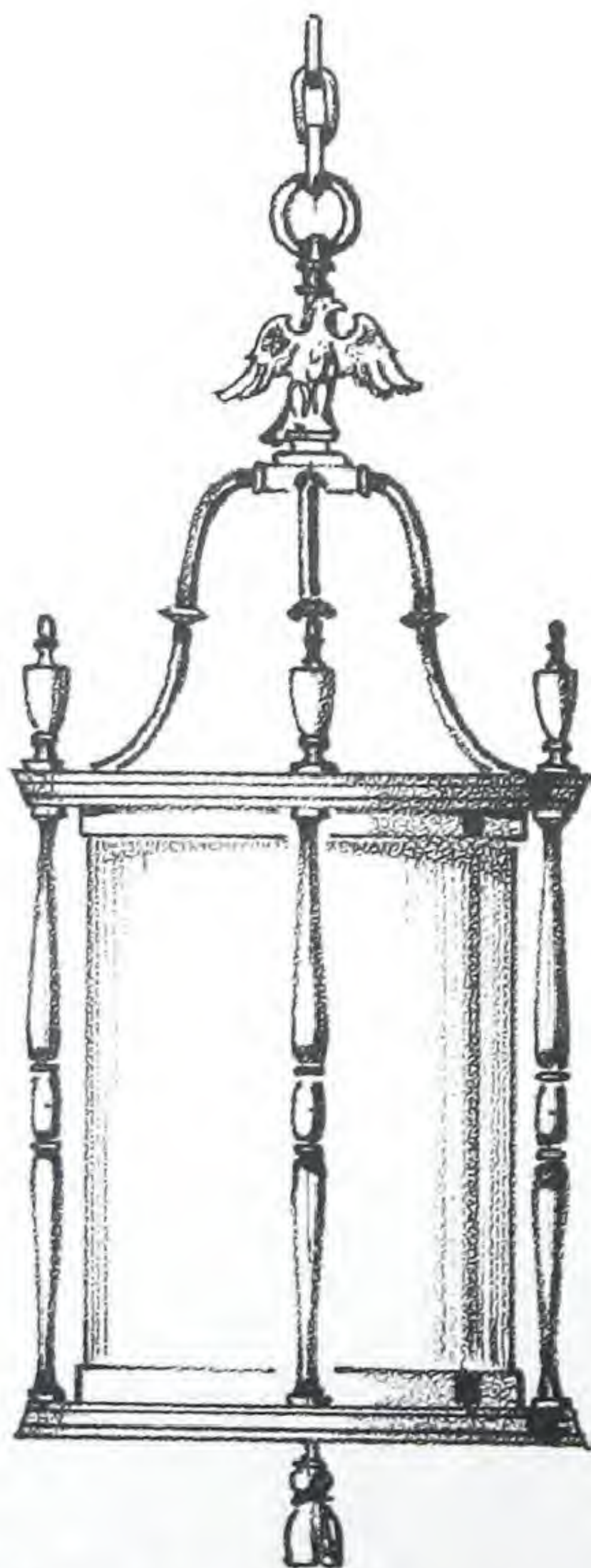
MONAX CUBES

Mould No.	Description	Diam., in.	Depth, in.	Fitter diam., in.
12087	Monax	4 3/8	4 3/8	3 1/4
2347	Monax	6	6	3 1/4
12089	Monax	7	7	4
12088	Monax	8	8	4



- MONAX - CYLINDERS -

DIAM.	MAX. LENGTH
2"	21"
2 1/2"	14"
3"	18"
3 1/2"	14"
4"	19"
4 1/2"	32"
5"	16"
6"	21"
7"	16"
8"	26"
10"	18"
12"	36"
13 5/8"	28"



- LANTERNS OF ALL -
 - SIZES AND STYLES -
 - CAN BE MADE WITH -
 - GLASS CYLINDERS -



- A - CLOSE - UP -
 - CYLINDER - LANTERN -
 - FOR - LOW - CEILINGS -

- CORNING - GLASS - WORKS -

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